ADVANCE AND EVER ADVANCING MITSUBISHI ELECTRIC

CE

MITSUBISHI ELECTRIC

SPLIT-TYPE, AIR CONDITIONERS

2000

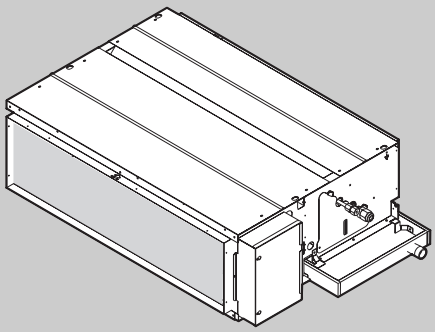
TECHNICAL & SERVICE MANUAL

Series PED Ceiling Concealed

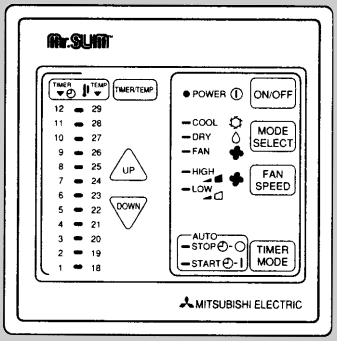
<indoor unit> Service ref.

Models PED-2EJA$_1$.UK
PED-2.5EJA$_1$.UK

This manual does not cover the following outdoor units. When servicing them, please refer to the service manual No.OC149B and this manual as a set.
PU-2VJA$_2$.UK
PU-2.5VJA$_2$.UK



INDOOR UNIT



REMOTE CONTROLLER

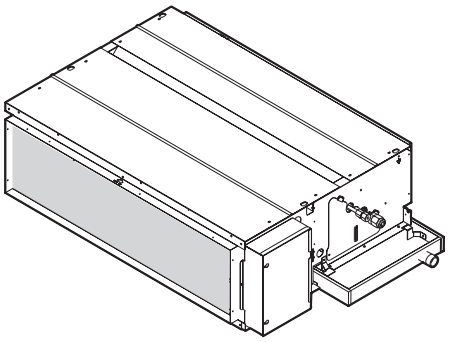
CONTENTS

The Slim Line.
From Mitsubishi Electric

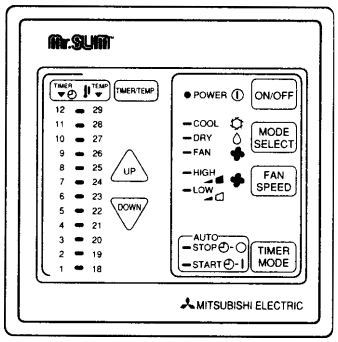
Mr.SLIM™

1 FEATURES

Series PED Ceiling Concealed



Indoor unit



Remote controller

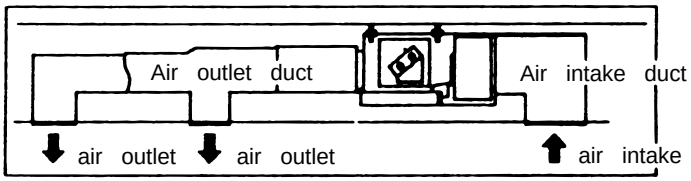
Models	Cooling capacity (240V)	
	W	Btu/h
PED-2EJA$_1$.UK	5,500	18,800
PED-2.5EJA$_1$.UK	6,500	22,200

1. TOTALLY INVISIBLE INDOOR UNIT BEHIND THE CEILING

The totally hidden indoor unit that lies above the ceiling surface enables you to utilize full floor space while allowing for flexible interior design. This new feature is recommended for stores and offices where the user's own imagination is allowed to be incorporated.

2. MOST SUITABLE FOR SIMULTANEOUS TWO ROOM AIR CONDITIONING

Using air ducts for cooling airflow that matches the structure and purpose of the room, enables you to provide two air outlets for simultaneous cooling of two rooms.



3. HIGH EXTERNAL STATIC PRESSURE

The exceptional external static pressure of 70Pa allows long ducts to be used more extensively to achieve convenient location of indoor units. (The factory setting is 30Pa.)

4. DRAIN WATER LIFT-UP MECHANISM (OPTION KIT)

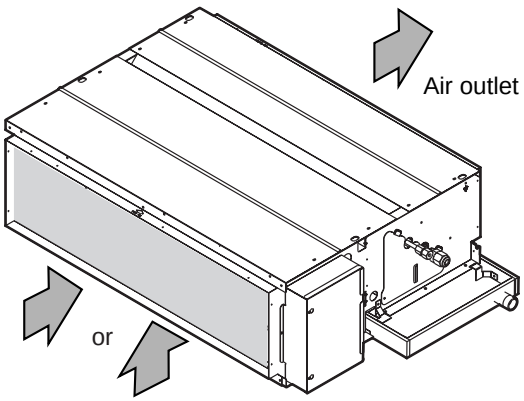
This allows more versatility when selecting drain piping layouts.

5. ADVANCED MICROPROCESSOR CONTROL

(1) Ultra - thin 12mm(1/2")remote controller.
(2) Attractive LED display .
Every operation condition is indicated on the LED display.
(3) Simultaneous display of set temperature and room temperature.
(4) Convenient 12 - hour ON-OFF timer.
This convenient timer allows the unit to be switched on and off automatically,at the time you set. Once the timer is set,the remaining time is shown on the LED display..
(5) Self - diagnostic function indicates problems instantly on remote controller.
(6) The useful memory feature can store instructions.
The previous set value is memorized so that constant temperature control can be obtained. For example,if a power failure occurs, this feature will conveniently memorize the previous temperature and reset accordingly.
(7) There is a polar 12 core - conductor cable between the remote controller and indoor board.The cable can be extended up to 50m.(option)

2 PART NAMES AND FUNCTIONS

● **Indoor Unit**

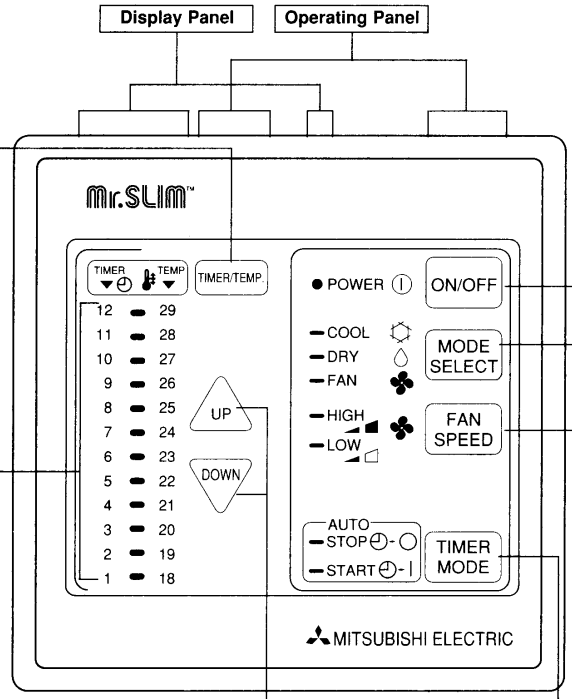


Air intake
(sucks the air from inside the room into the unit)

● Remote controller

● Settings remain in effect until changed. Air conditioner can be operated by simply pushing ON/OFF button once settings have been made.

● Operation buttons



TIMER / TEMP.

This button is used to change between display of room temperature and display of remaining timer during "AUTO STOP" operation. Green lamps light in selected display mode.

Lamps display remaining timer time or room temperature.

Remaining timer time display

Lamps indicate time remaining until timer stops timed operation. Green lamps corresponding to remaining number of hours light.

Room Temperature display

Lamps display temperature settings and actual room temperatures.

- Temperature settings; Green lamps light.
- Temperature in room; Green lamps flash.

UP and DOWN buttons

- Temperature control (While "TEMP" green lamp is lit.)
  Use UP and DOWN buttons to set disired temperature between 18 and 29°C.
- Timed operation (While green "TIMER" lamp is lit.)
  Use UP and DOWN buttons to set timed operation between one and twelve hours.

ON / OFF button

Pushing button starts operation. Pushing again stops operation. Green lamp remains lit during operation

MODE SELECT button

This button is used to change between cooling, ventilation and DRY operation modes. One of three green lamps lights to indicate mode in effect.

FAN SPEED button

This button is used to change between low and high fan speeds. One of two green lamps lights to indicate fan speed in effect.

TIMER MODE button

Used for selecting timed starting or stopping. Green lamps light to indicate timer mode selected.

(Example display readings are for explanations only ;actual display readings will differ.)

Attention :

- Pushing UP and Down buttons together for more than two seconds will initiate "trial run" or "inspection" mode. Avoid pushing these buttons simultaneously during normal operation. Push ON / OFF button to cancel trial run or inspection mode if initiated by accident.
- All green lamps turn off when air conditioner is stopped.
- Avoid operation of buttons with fingernails or other sharp objects. Sharp objects may scratch operating panel.

3 SPECIFICATION

Item \ Model				PED-2EJA$_1$.UK	PED-2.5EJA$_1$.UK
Cooling capacity ✻4			Btu/h	18,800	22,200
			W	5,500	6,500
Total input ✻4			kW	2.63	2.69
INDOOR UNIT	Power supply			~/N, 50Hz, 220-240V	
	Input		kW	0.15	0.17
	Running current		A	0.63	0.72
	Starting current		A	1.1	1.6
	External finish			Galvanized sheets	
	Heat exchanger			Plate fin coil	
	Fan (drive) ~No.			Centrifugal (direct)x2	
	Fan motor output ✻1		kW	0.076	0.116
	Airflow (Low-High)		CMM,(CFM)	13.5- 17(476-600)	17-21 (600-740)
	External static pressure ✻2		Pa(mmAq)	30(3)/70(7) at Hi-notch	
	Operation control & Thermostat			Remote control&Built-in	
	Noise level (Low-High) ✻3, ✻5		dB (A)	36-40	37-41
	Cond. drain conn. O.D.		mm, (in)	32(1-1/4)	
	Dimensions	W	mm, (in)	935(36-13/16)	1175(46-1/8)
		D	mm, (in)	700(27-9/16)	700(27-9/16)
		H	mm, (in)	295(11-5/8)	295(11-5/8)
	Weight		kg, (lbs)	33(73)	42(93)
OUTDOOR UNIT	Model name			PU-2VJA.UK	PU-2.5VJA.UK
	Power supply			~/N 50Hz 220-240V	~/N 50Hz 220-240V
	Input		kW	2.48	2.52
	Running current		A	10.8	10.7
	Starting current		A	52	52
	External finish			Munsell 5Y 7/1	
	Refrigerant control			Capillary tube	
	Compressor			Hermetic	
	Model			NHJ41VMDT	
	Motor output		kW	1.9	
	Starter type			Line Start	
	Protection devices			Inner thermostat,HP switch,LP switch	
	Heat exchanger			Plate fin coil	
	Fan (drive) ~No.			Propeller(direct)X1	Propeller(direct)X1
	Fan motor output		kW	0.065	0.085
	Airflow		CMM,(CFM)	45(1588)	50(1765)
	Noise level		dB (A)	49	52
	Dimensions	W	mm, (in)	870(34-1/4)	870(34-1/4)
		D	mm, (in)	295+24(11-5/8 add 1)	295+24(11-5/8 add 1)
		H	mm, (in)	650(25-5/8)	850(33-7/16)
	Weight		kg, (lbs)	60(132)	71(157)
REFRIGERANT PIPING	Refrigerant			R-22	
	Charge		kg, (lbs)	1.78(3.92)	2.4(5.29)
	Pipe size O.D.	Liquid	mm, (in)	9.52(3/8)	
		Gas	mm, (in)	15.88(5/8)	
	Connection method	Indoor side		Flared	
		Outdoor side		Flared	
	Between the indoor & outdoor unit	Height difference (m)		30	
		Piping length (m)		30	

✻1. External static pressure at 70Pa.
✻2. Ex-works at 30Pa.
✻3. External static pressure at 30Pa.
✻4.Rating condition <JIS B 8615>
INDOOR: 27˚CDB, 19˚CWB
OUTDOOR: 35˚CDB
✻5.Noise level : Sound pressure level

4 DATA

1. PERFORMANCE DATA

1) COOLING CAPACITY

Service Ref.	Indoor intake air WB˚C	Outdoor intake air DB˚C											
		20		25		30		35		40		45	
		CA	P.C.	CA	P.C.	CA	P.C.	CA	P.C.	CA	P.C.	CA	P.C.
PED-2EJA$_1$.UK	16	5,599	2.13	5,445	2.22	5,225	2.38	4,989	2.54	4,741	2.70	4,488	2.15
	18	5,957	2.17	5,803	2.27	5,566	2.44	5,324	2.61	5,071	2.77	4,813	2.30
	20	6,320	2.21	6,171	2.30	5,929	2.49	5,676	2.66	5,418	2.84	5,154	2.47
	22	6,688	2.25	6,562	2.35	6,309	2.54	6,050	2.72	5,786	2.92	5,511	2.63
PED-2.5EJA$_1$.UK	16	6,617	2.18	6,435	2.27	6,175	2.43	5,896	2.60	5,603	2.76	5,304	2.20
	18	7,039	2.22	6,858	2.32	6,578	2.49	6,292	2.66	5,993	2.83	5,688	2.36
	20	7,468	2.26	7,355	2.36	7,007	2.54	6,708	2.72	6,403	2.90	6,091	2.52
	22	7,904	2.30	7,754	2.40	7,456	2.60	7,150	2.79	6,838	2.98	6,513	2.70

Note C A: Capacity(W)
P.C.: Power consumption(kW)

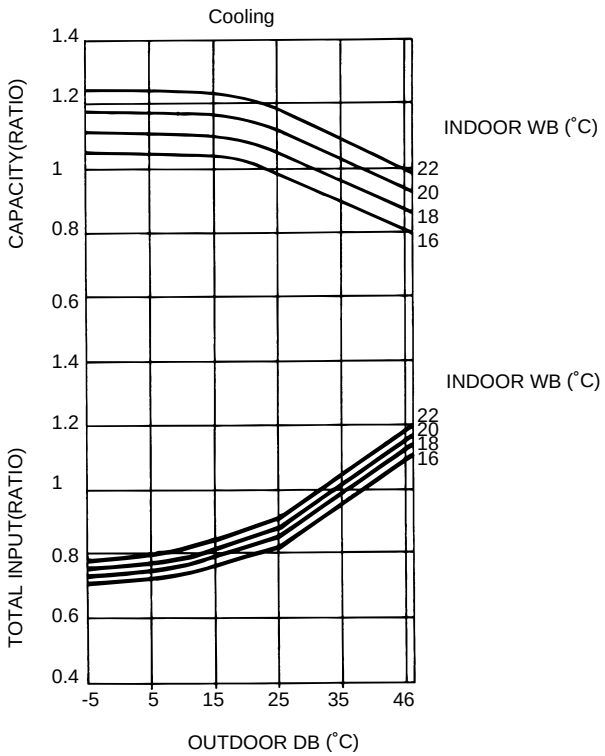
2) COOLING CAPACITY CORRECTION FACTORS

Service Ref.	Refrigerant piping length(one way)					
	5m	10m	15m	20m	25m	30m
PED- 2EJA$_1$.UK	1.00	0.985	0.975	0.964	0.954	0.944
PED- 2.5EJA$_1$.UK	1.00	0.983	0.972	0.961	0.951	0.940

2. PERFORMANCE CURVE (CAPACITY RATIO & TOTAL INPUT RATIO)

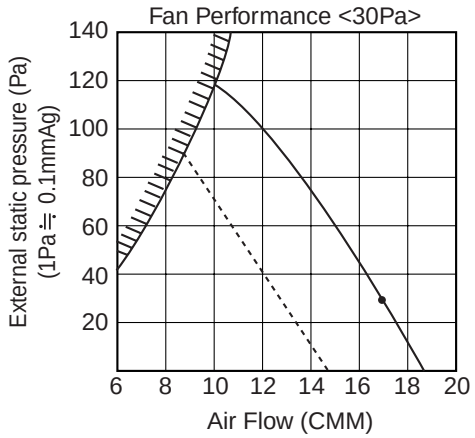
PED-2EJA1.UK

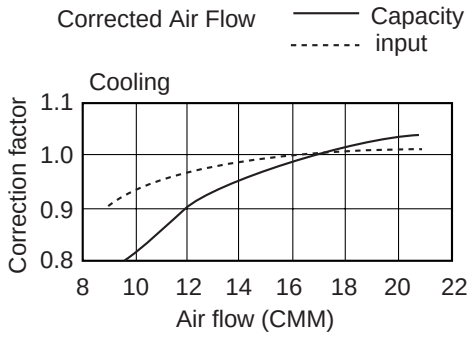
PED-2.5EJA1.UK

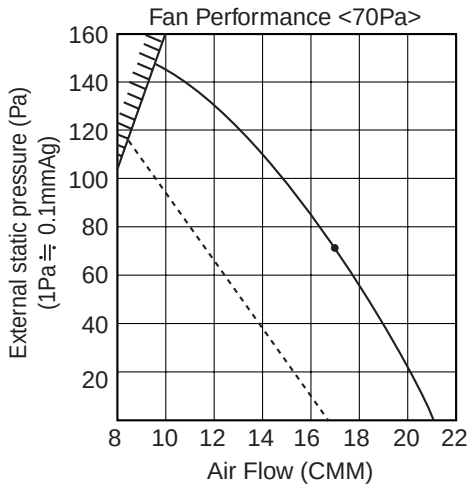


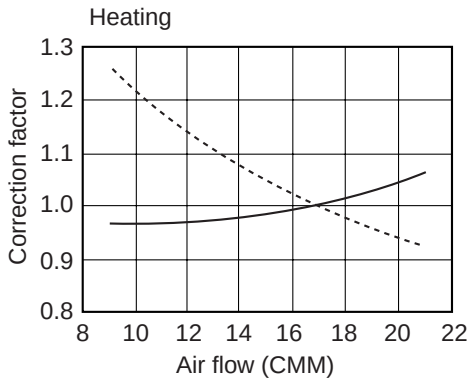
3. FAN PERFORMANCE AND CORRECTED AIR FLOW

PED-2EJA1.UK

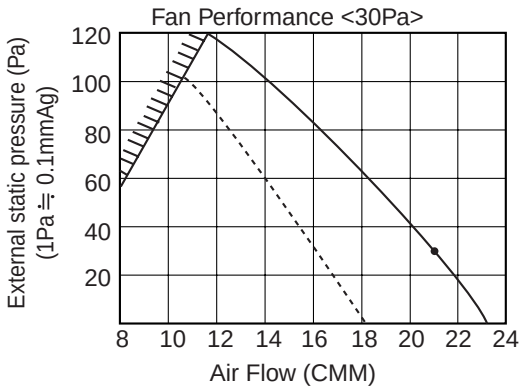


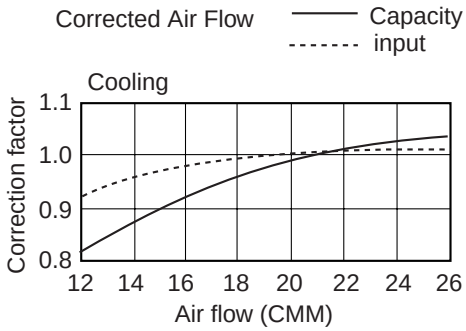


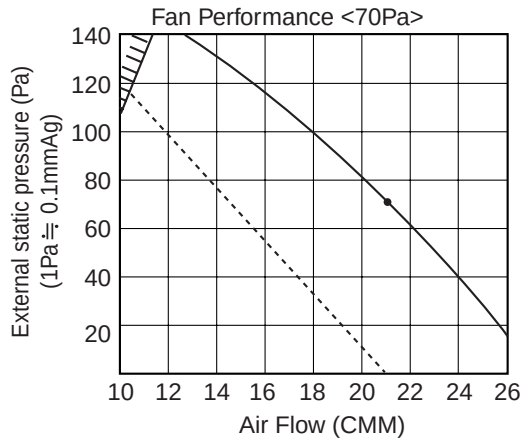


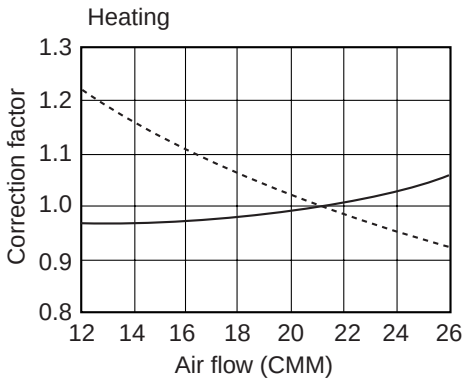


PED-2.5EJA1.UK









4. ELECTRICAL DATA

Indoor ·····220V 50Hz 1phase
Outdoor ··· 220V 50Hz 1phase

Models		Indoor	PED-2EJA$_1$.UK	PED-2.5EJA$_1$.UK
		Outdoor	PU-2VJA	PU-2.5VJA
Capacity(W)			5,400	6,300
Total input(kW)			2.57	2.61
Indoor	Input(kW)		0.13	0.15
	Current(A)		0.60	0.69
	Starting current(A)		1.05	1.53
Outdoor	Input(kW)		2.44	2.46
	Current(A)		11.3	11.4
	Starting current(A)		48	48

Indoor ·····230V 50Hz 1phase
Outdoor··· 230V 50Hz 1phase

Models		Indoor	PED-2EJA$_1$.UK	PED-2.5EJA$_1$.UK
		Outdoor	PU-2VJA	PU-2.5VJA
Capacity(W)			5,450	6,400
Total input(kW)			2.60	2.65
Indoor	Input(kW)		0.14	0.16
	Current(A)		0.61	0.70
	Starting current(A)		1.07	1.56
Outdoor	Input(kW)		2.46	2.49
	Current(A)		11.0	11.0
	Starting current(A)		50	50

Indoor·····240V 50Hz 1phase
Outdoor··· 240V 50Hz 1phase

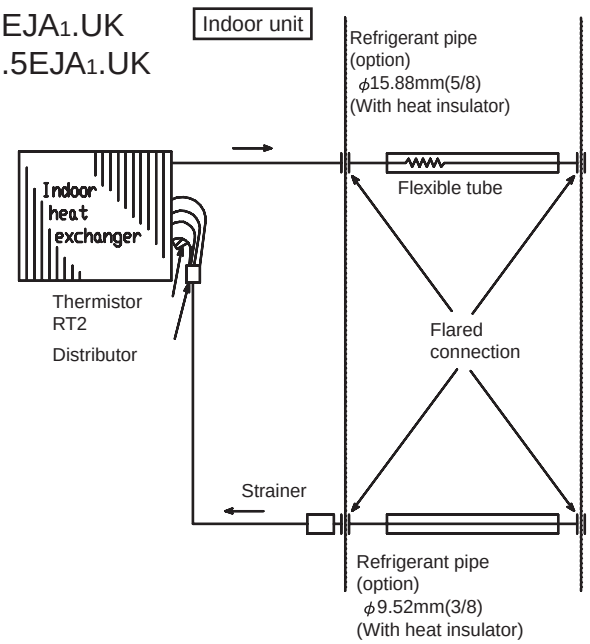
Models		Indoor	PED-2EJA$_1$.UK	PED-2.5EJA$_1$.UK
		Outdoor	PU-2VJA	PU-2.5VJA
Capacity(W)			5,500	6,500
Total input(kW)			2.63	2.69
Indoor	Input(kW)		0.15	0.17
	Current(A)		0.63	0.72
	Starting current(A)		1.10	1.60
Outdoor	Input(kW)		2.48	2.52
	Current(A)		10.8	10.7
	Starting current(A)		52	52

5. STANDARD OPERATION DATA (COOLING)

Models			PED-2EJA$_1$.UK	PED-2.5EJA$_1$.UK
Total	Capacity	W	5,500	6,500
	Input	kW	2.63	2.69
Electrical circuit	Indoor unit model		PED-2EJA	PED-2.5EJA
	Phase Hz		1, 50	1, 50
	Volts		240	240
	Amperes		0.63	0.72
	Outdoor unit-model		PU-2VJA	PU-2.5VJA
	Phase,Hz		1, 50	1, 50
	Volts		240	240
	Amperes		10.8	10.7
Refrigerant circuit	Discharge pressure	MPa	1.98	2.00
	Suction pressure	MPa	0.46	0.51
	Discharge temperature	˚C	77.3	78.6
	Condensing temperature	˚C	52.5	53.1
	Suction temperature	˚C	15.3	8.5
	Ref.Pipe length	m	5	5
Indoor side	Intake air temperature	DB˚C	27.0	27.0
		WB˚C	19.0	19.0
	Diischarge air temperature	DB˚C	14.8	16.0
Outdoor side	Intake air temperature	DB˚C	35.0	35.0
		WB˚C	24.0	24.0
SHF			0.74	0.71
BF			0.32	0.27

5 REFRIGERANT SYSTEM DIAGRAM

PED-2EJA1.UK
PED-2.5EJA1.UK

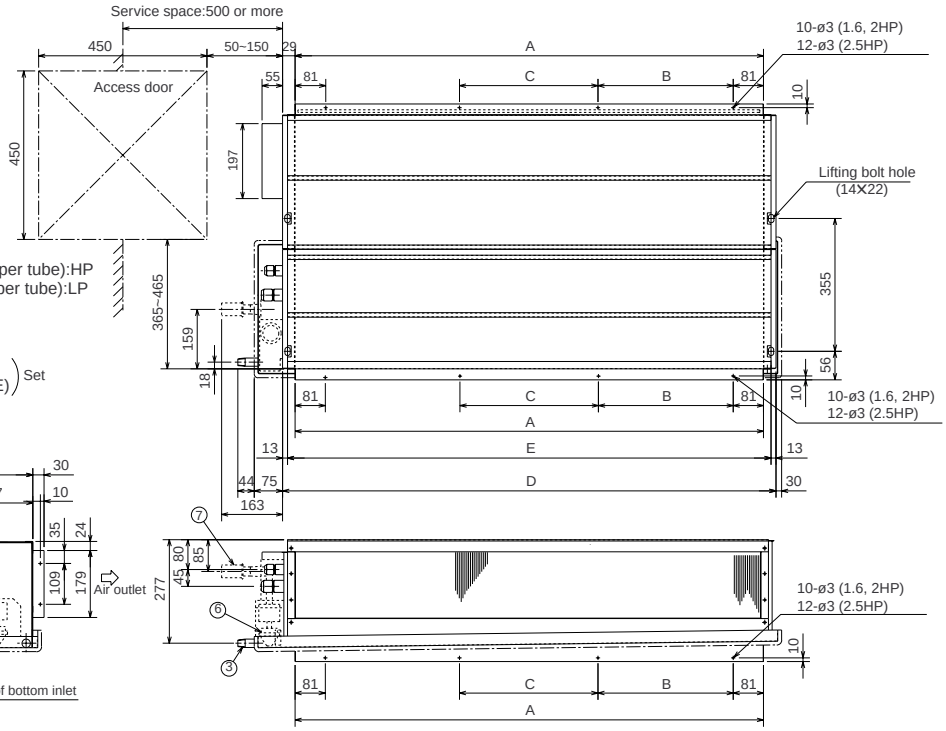


6 OUTLINES & DIMENSIONS

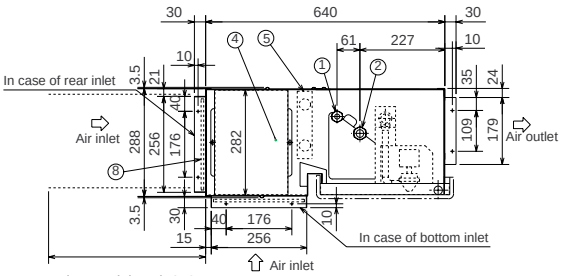
1. INDOOR UNIT

PED-2EJA1.UK
PED-2.5EJA1.UK

Model	A	B	C	D	E
PED-2	772	305	-	830	804
PED-2.5	1012	280	290	1070	1044

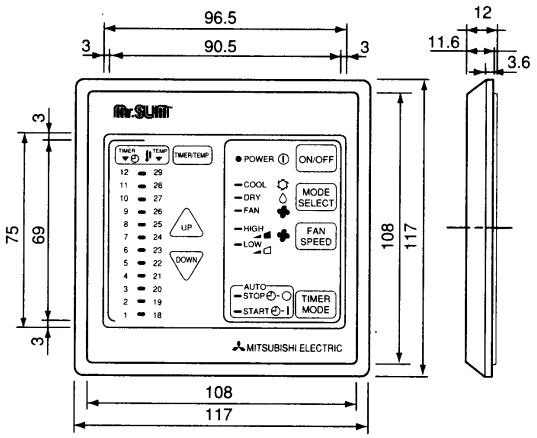


① Refrigerant piping flare connection (liquid ø9.52 copper tube):HP
② Refrigerant piping flare connection (gas ø15.88 copper tube):LP
③ Drain R1(External thread)
④ Electrical parts box
⑤ Electric Heater···Only PEHD-EKHA Type
⑥ Drain Pump (Option)
⑦ Drain Pipe (Option)···Use VP25(O.D.ø32 PVC TUBE) } Set
⑧ Filter

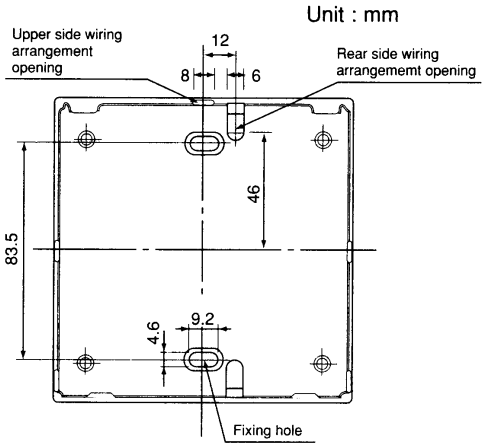


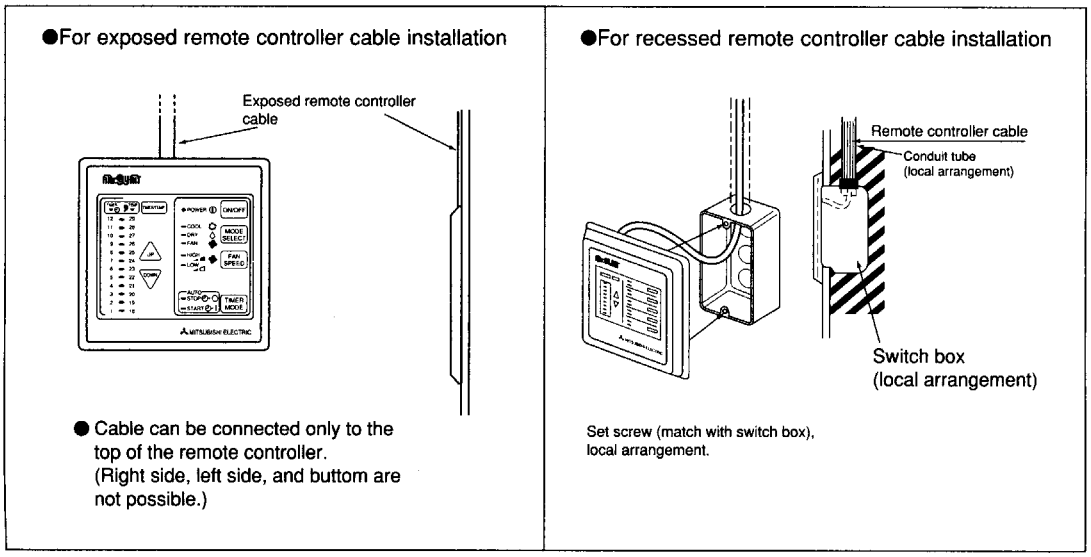
Keep duct-work length 850mm or more.
Be sure to apply the air filter (field supply) near the air inlet grille.

2. REMOTE CONTROLLER



Unit : mm

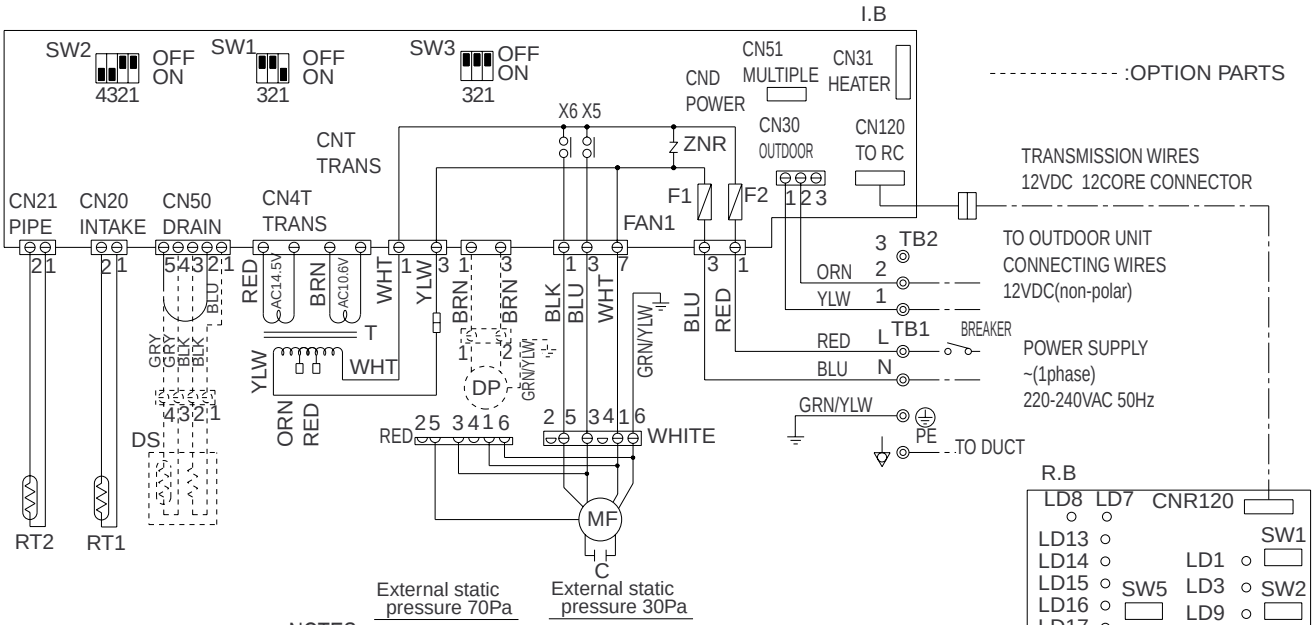




Note : The cable for the remote controller has 12m (39ft) length and 12-core with connectors OD 5.8. (mm)

7 WIRING DIAGRAM

MODELS:PED-2,2.5EJA1 WIRING DIAGRAM



NOTES

1.Since the indoor transfomer(T) is connected with 240V power. if 220,230V power is used, Change the wiring connection shown at fig: 1

fig: *1 When power supply is

240	YELLOW
230	ORANGE
220	RED

SYMBOL EXPLANATION(*……Option parts)

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
C	Capacitor (fan motor)	LD11<R.B>	Off timer indicator LED	SW6(R.B)	Temperature and timer setting up switch
CN120<I.B>	Connector (remote controller)	LD12<R.B>	On timer indicator LED	SW7(R.B)	Temperature and timer setting down switch
CN51<I.B>	Connector (centrally control)	LD13-24<R.B>	Temperature/Timer remaining time indicator LED	SW8(R.B)	Timer continuous ON/OFF switch
CNR120<R.B>	Connector (remote controller)			TB1	Terminal block (power)
F1, 2<I.B>	Fuse <6.3A>	MF	Indoor Fan motor	TB2	Terminal block (indoor/outdoor connecting line)
I.B	Indoor controller board	SW1(I.B)	Function switch	RT1	Thermistor (room temperature sensor 0˚C/15kΩ, 25˚C/5.4kΩ)
LD1<R.B>	Run indicator LED	SW2(I.B)	Unit switch		
LD3<R.B>	Cooling indicator LED	SW3(I.B)	Emergency operation switch	RT2	Thermistor (pipe temperature sensor 0˚C/15kΩ, 25˚C/5.4kΩ)
LD4<R.B>	Fan mode indicator LED	SW1(R.B)	ON/OFF switch		
LD5<R.B>	Fan high indicator LED	SW2(R.B)	Operation mode switch	X5,X6(I.B)	Auxiliary relay (fan motor)
LD7<R.B>	Indicator mode temperature LED	SW3(R.B)	Fan hige/low switch	ZNR<I.B>	Varistor
LD8<R.B>	Indicator mode timer LED	SW5(R.B)	Indicator switch	CNP	Drain pump connector
LD9<R.B>	Dry indicator LED	R.B	Remote controller board	CN50	Drain sensor connector
LD10<R.B>	Fan low indicator LED	T	Transformer	* DP	Drain pump
				* DS	Drain sensor

NOTES

1. Since the outdoor side electric wiring may change be sure to check the outdoor unit electric wiring for servicing.
2. Symbols used in circuit diagram above are, ◎:Terminal block, ⏀ :connector.
3. Emergency operation
   If a trouble occurs with either the remote controller or the indoor microcomputer and no other trouble exists,emergency operation for cooling can be performed by changing the setting of dip switch (SW3<I.B>) on the indoor controller board (emergency dry operation is not possible).

<Check items>

(1) Make sure that no other trouble exists with the outdoor unit. Trouble with the outdoor unit prevents emergency operation. (If any trouble exists with the outdoor unit,the trouble location will be displayed on the remote controller and the trouble position will be shown on the outdoor controller board LED.See electric circuit diagram of the outdoor unit for details.)

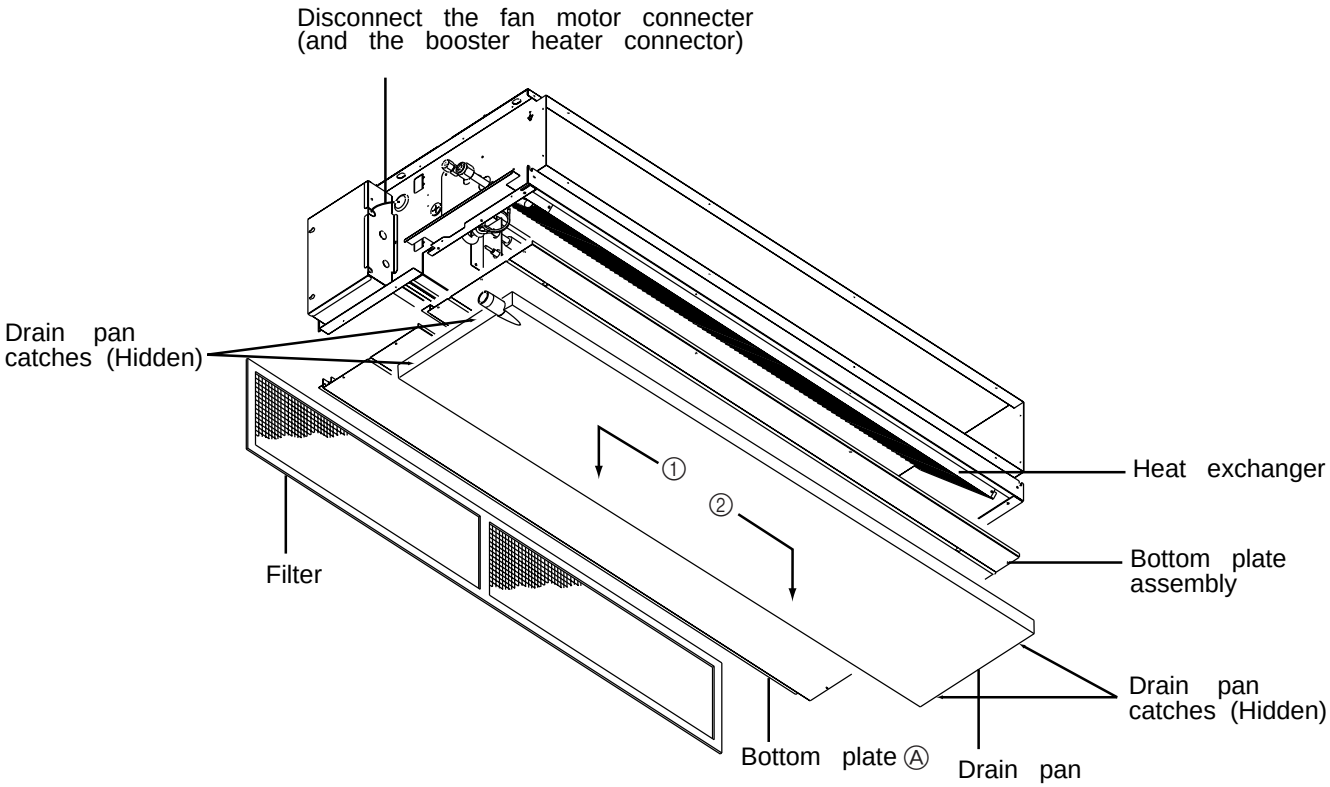
(2) Make sure that there is no trouble with the indoor fan. Emergency operation will be a continuous run with the power ON/OFF(ON/OFFwith the remote controller is not possible).

<Emergency operation procedure>

(1) Set the dip switch(SW3<I.B>)on the indoor controller board to 1 - 2 on and 3 off for cooling.
(2) Turn on the outdoor unit side circuit breaker.
(3) During emergency operation indoor fan runs at High speed.
(4) Thermostat will not function.Cold air blows out for defrosting during heating thus do not operate de frosting for a long time.
(5) Emergency cooling should be limited to 10 hours maximum(the indoor unit heat exchanger may freeze).

8 DISASSEMBLY INSTRUCTIONS

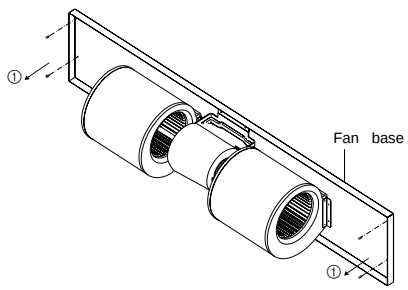
Figure1.



Ⅰ. Removing the fan motor

1. Removing the 9 screws that fix the bottom plate Ⓐ, and remove it.
2. Removing the drain pan as follows:
   (1) Remove the screw that fixes the drain pan.
   (2) Slide the drain pan in the direction ①, Figure1 and unhook the drain pan catch near the drain pipe.
   (3) Slide the drain pan in the direction ②, Figure1 and unhook the 2 catches on the other side of the drain pipe.
3. Remove the 8 screws that fix the bottom plate assembly, and remove it.
4. Disconnect the fan motor connector from the controller box.
5. Remove the fan plate as follow:

Figure2.



(1)Remove the 4 screws①
(2)Slide down the fan plate to remove.

6. Remove the sirocco fan setting screw and the motor fixture setting screw to remove the motor fixture.
   Remove the other motor fixture as well, and then remove the fan motor.

Figure3.

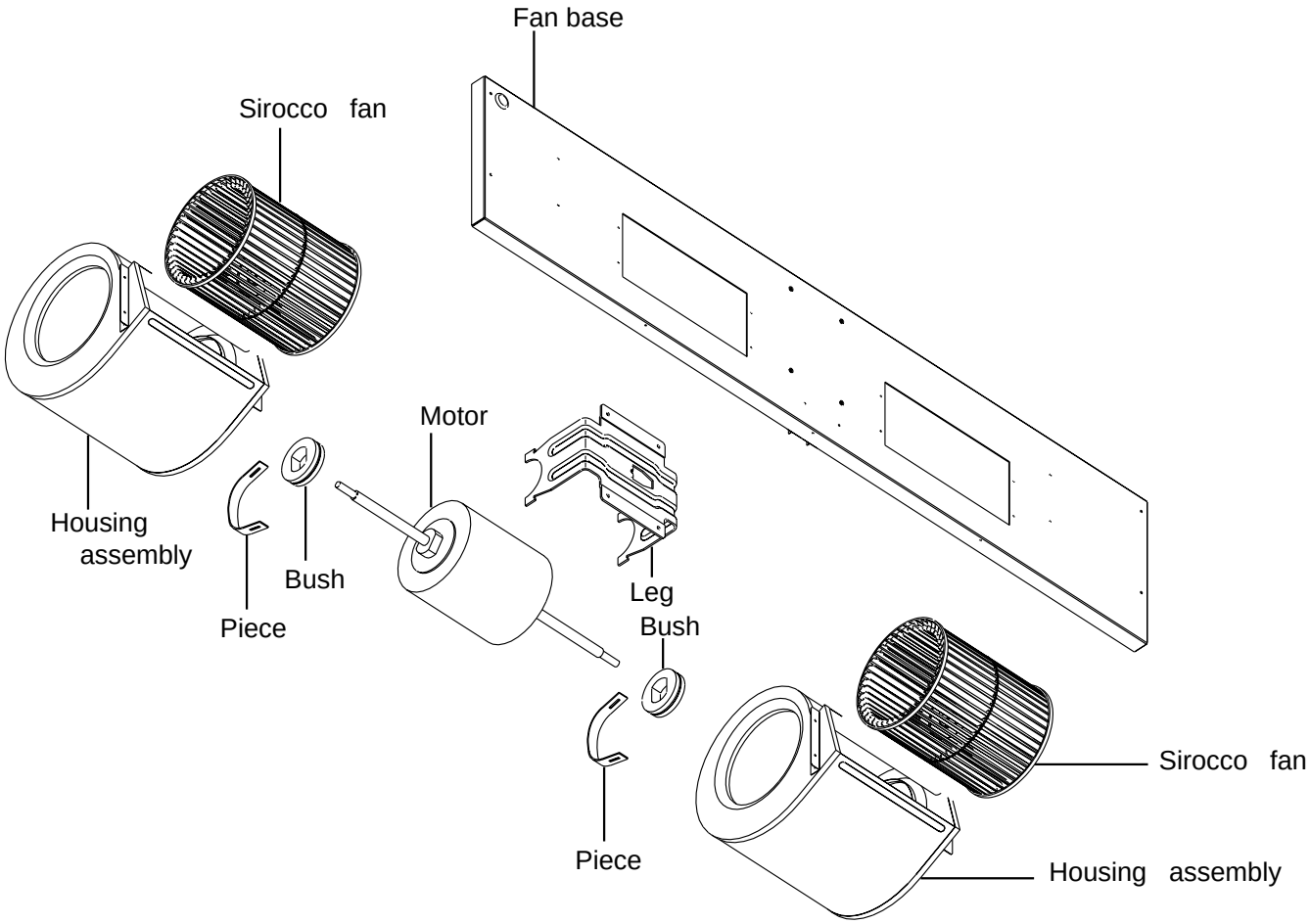
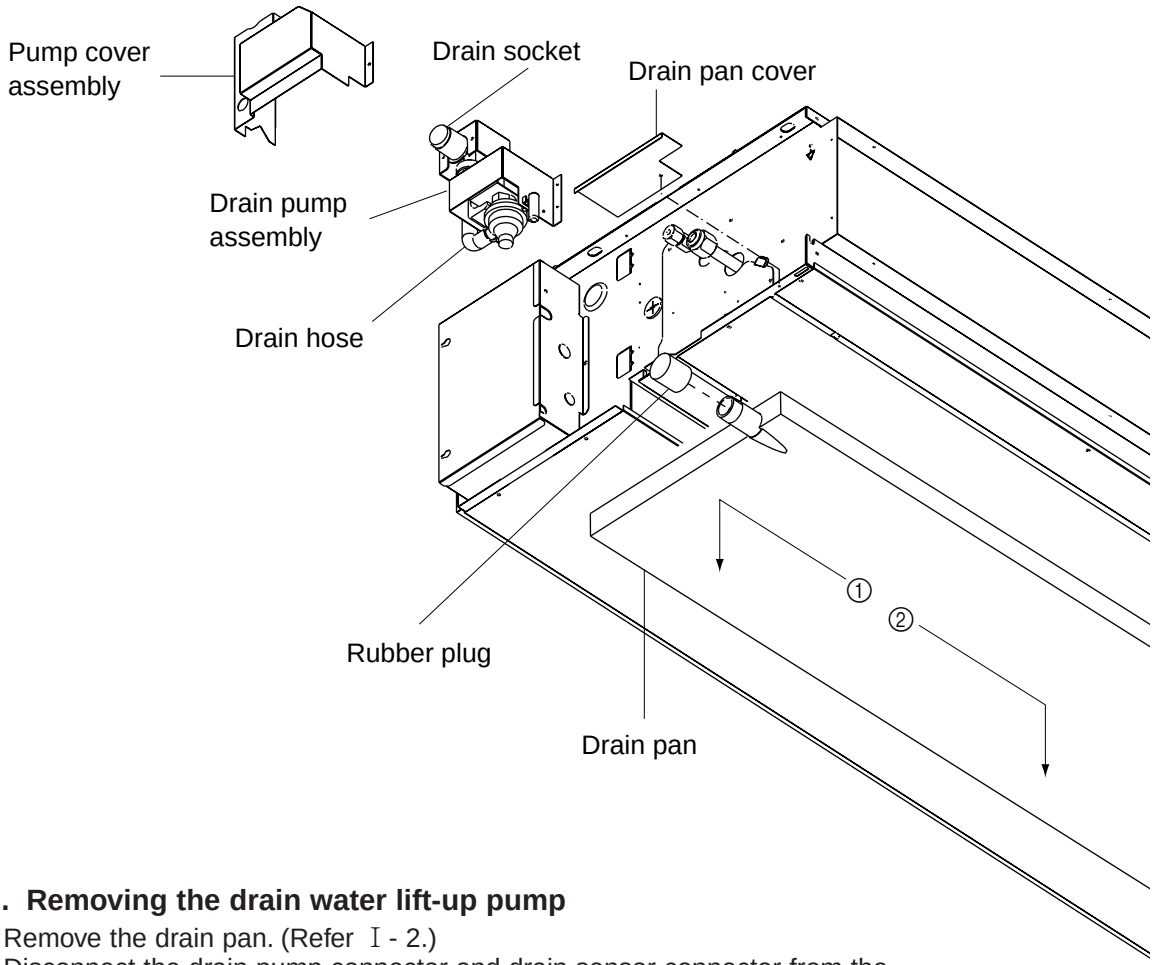

Fan base
Sirocco fan
Motor
Housing assembly
Bush
Piece
Leg
Bush
Piece
Sirocco fan
Housing assembly

Figure4.



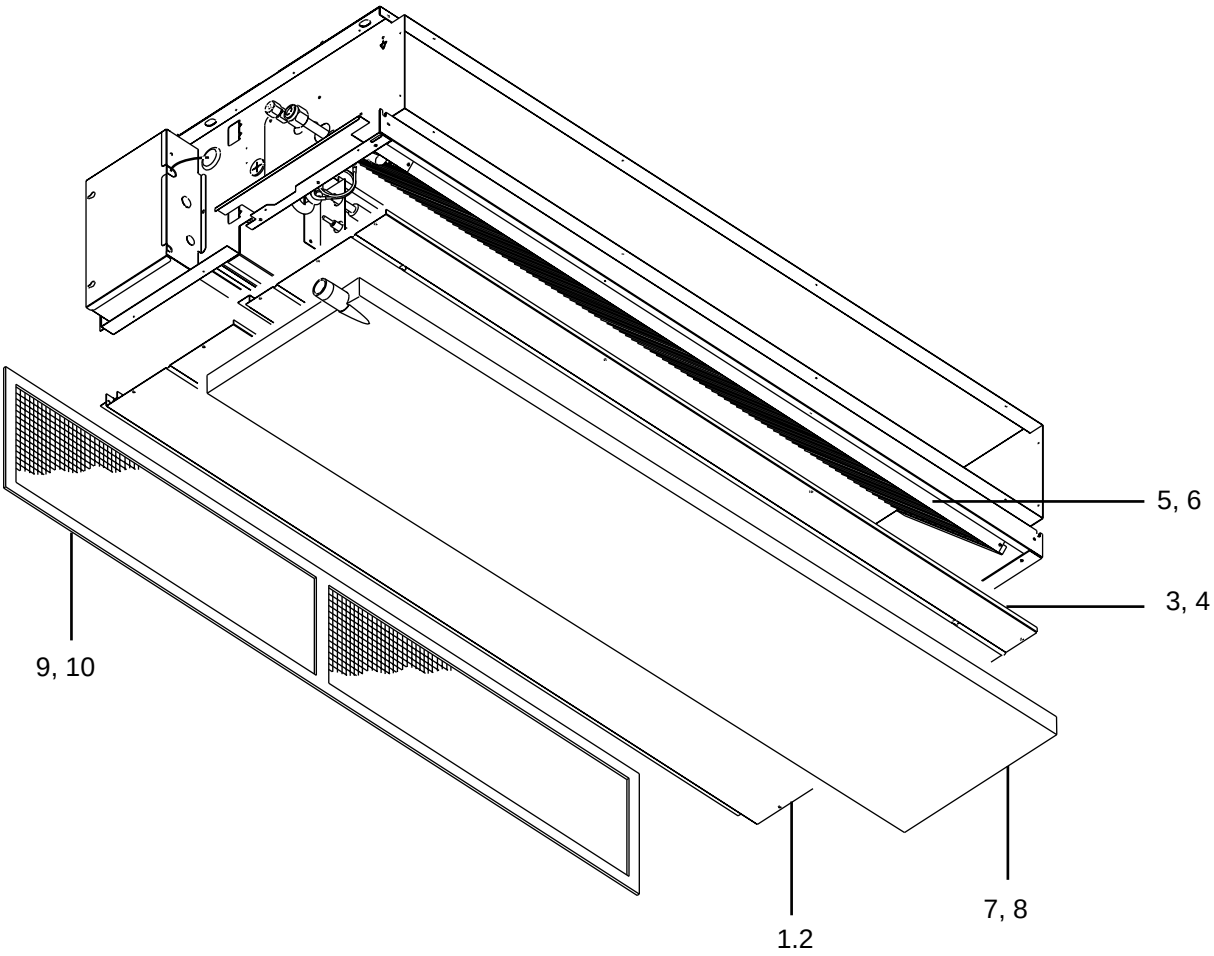
Ⅱ. Removing the drain water lift-up pump

1. Remove the drain pan. (Refer Ⅰ- 2.)
2. Disconnect the drain pump connector and drain sensor connector from the controller box.
3. Remove the two screws of the pump cover assembly.
4. Remove the drain hose from drain socket.
5. Remove the three screws of the drain pump assembly.
6. Remove the earth screw and four nuts of the drain pump assembly.
7. Remove the drain pump from drain pump assembly.

9 PARTS LIST

PED-2EJA1.UK
PED-2.5EJA1.UK

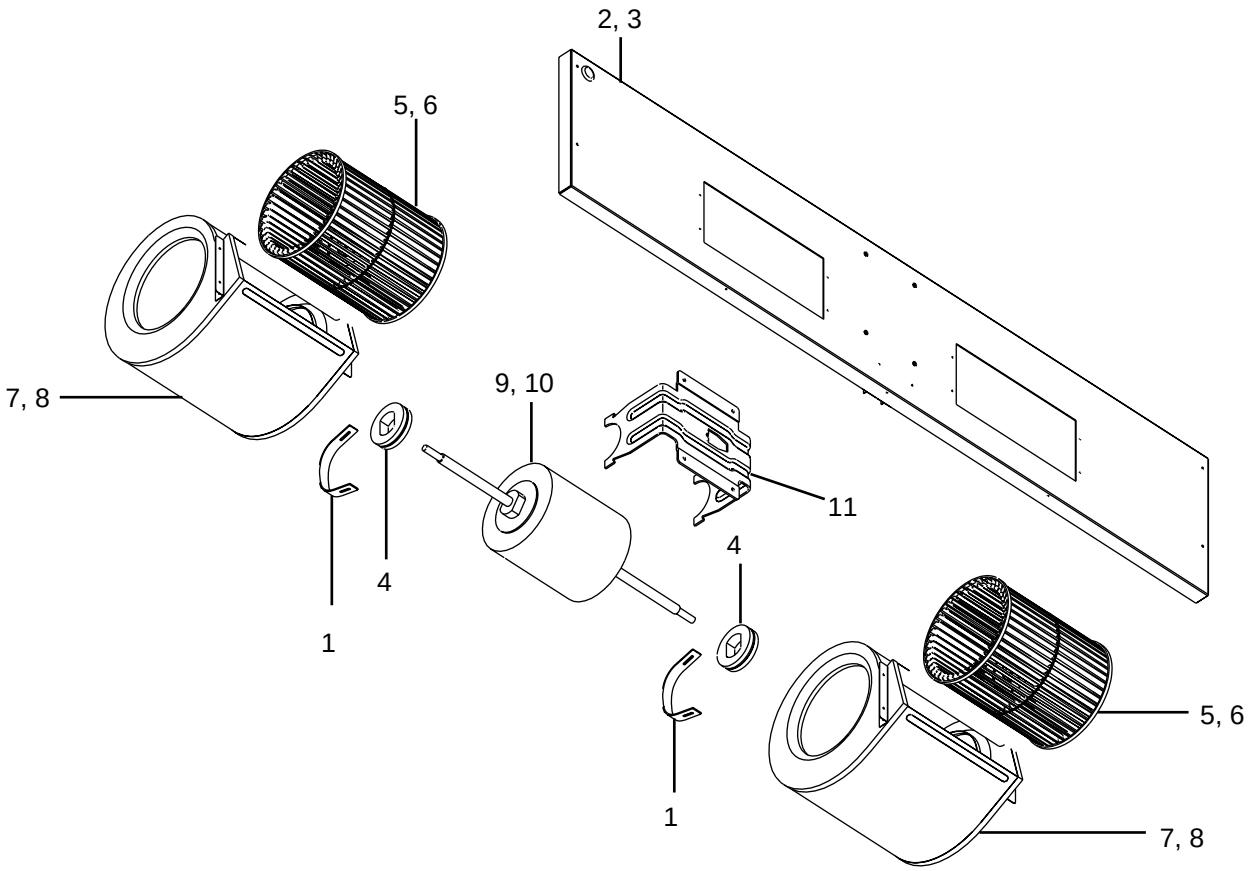
EXTERNAL PARTS



No.	Part No.	Part Name	Drawing No.	Qt'y/set								Spec.
				PED-2EJA1	PED-2.5EJA1							
1	S70 031 669	Bottom plate 1	W638939Z03	1								
2	S70 011 669	Bottom plate 1	W638917Z03		1							
3	S70 081 669	Bottom plate 2 ass'y	W638940G02	1								
4	S70 091 669	Bottom plate 2 ass'y	W638918G02		1							
5	S70 020 480	H.EX.General ass'y	W268511G02	1								
6	S70 021 480	H.EX.General ass'y	W268511G03		1							
7	S70 011 529	Drain pan ass'y	W638942G01	1								
8	S70 021 529	Drain pan ass'y	W638920G01		1							
9	S70 021 500	Filter	W638181G01	1								
10	S70 031 500	Filter	W638181G02		1							
11												

PED-2EJA1.UK
PED-2.5EJA1.UK

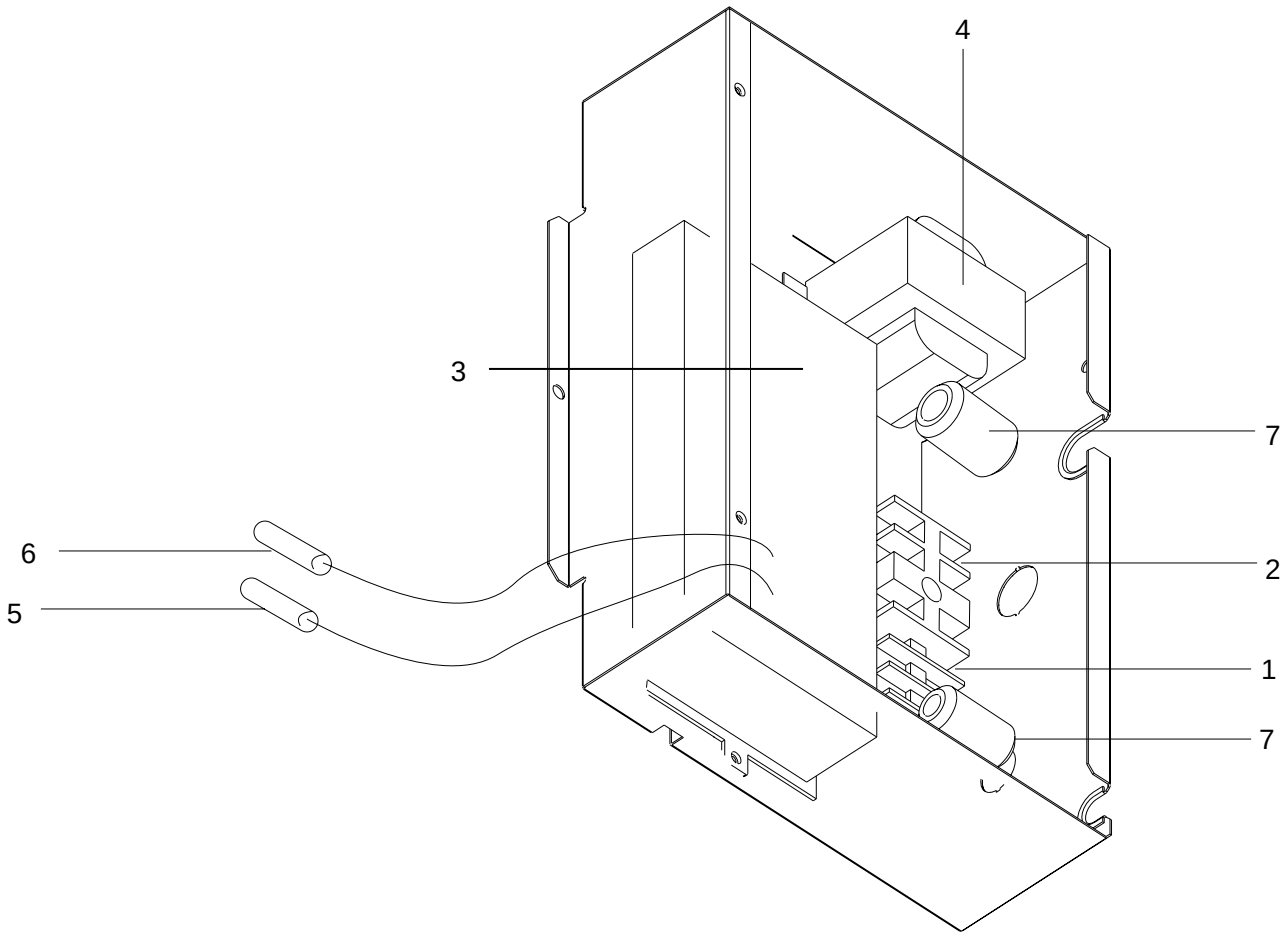
BLOWER PARTS



No.	Part No.	Part Name	Drawing No.	Qt'y/set								
				PED-2EJA1	PED-2.5EJA1							
1	S07 652 131	Attachment	W353715H01	2	2							
2	S70 051 677	Fan base ass'y	W638932G02	1								
3	S70 061 677	Fan base ass'y	W638905G02		1							
4	S70 922 105	Bush	W818836H01	2	2							
5	S70 A88 114	Sirocco fan	W122296G01	2								
6	S70 A89 114	Sirocco fan	W122297G01		2							
7	S70 989 110	Housing ass'y	W638949G03	2								
8	S70 985 110	Housing ass'y	W638949G04		2							
9	S70 Y58 220	Motor	P714316X02	1								<MF>
10	S70 Y56 221	Motor	P714774X01		1							<MF>
11	S70 652 130	Motor support	W241060H03	1	1							
12												
13												
14												

PED-2EJA1.UK
PED-2.5EJA1.UK

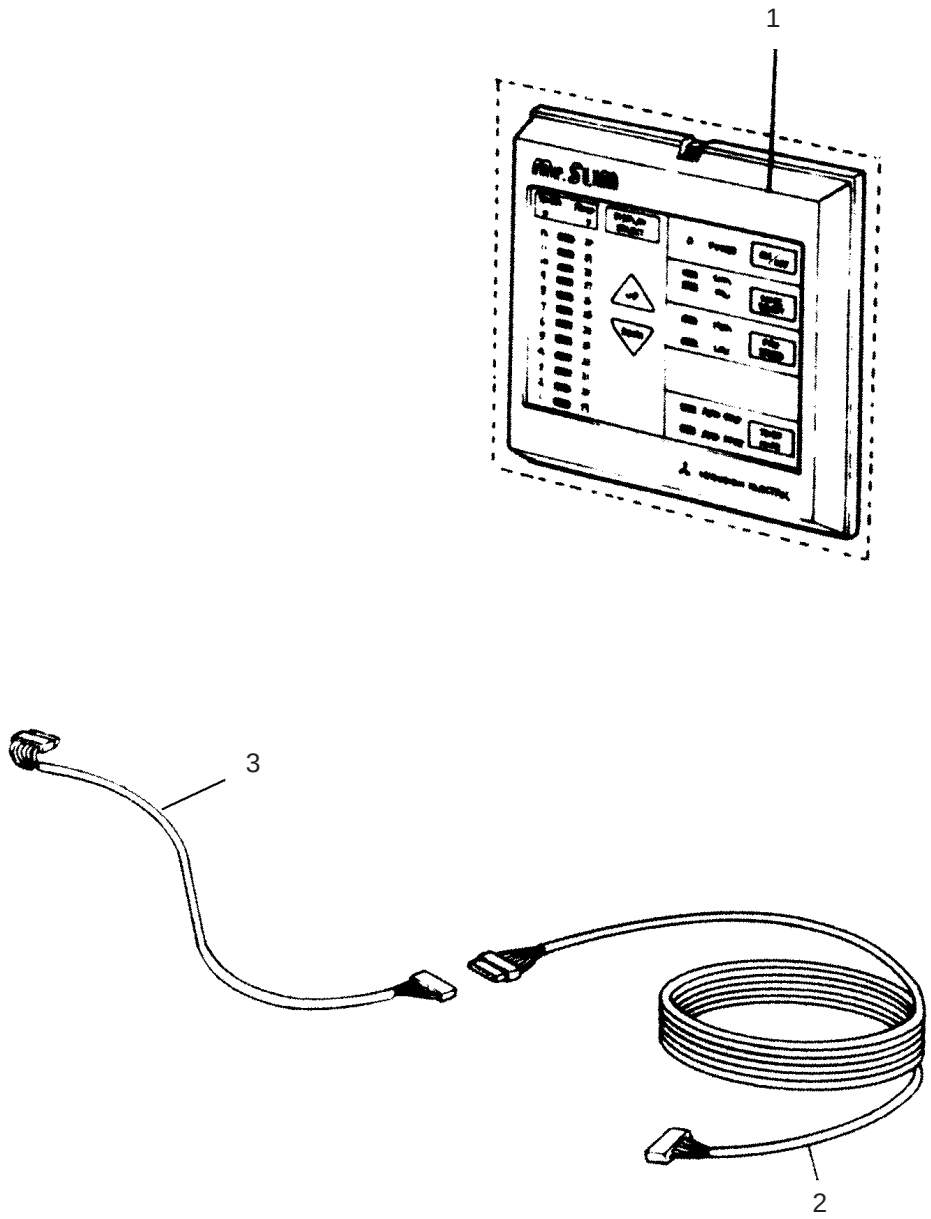
CONTROL BOX PARTS



No.	Part No.	Part Name	Drawing No.	Qt'y/set								Spec.
				PED-2EJA1	PED-2.5EJA1							
1	S70 918 717	Terminalbed	P436109X01	1	1							<TB2>
2	S70 979 717	Terminalbed	P436110X01	1	1							<TB1>
3	S70 010 310	Controller	BG00L760G22	1	1							<I.B.>
4	S70 11K 799	Transformer	BG65T178H03	1	1							<T>
5	S70 010 202	Thermistor S	BG71V161H04	1	1							<RT1>
6	S70 020 202	Thermistor H	BG71V162H08	1	1							<RT2>
7	S70 010 292	Ferrite core	P419114X01	2	2							
8												
9												
10												

PED-2EJA1.UK
PED-2.5EJA1.UK

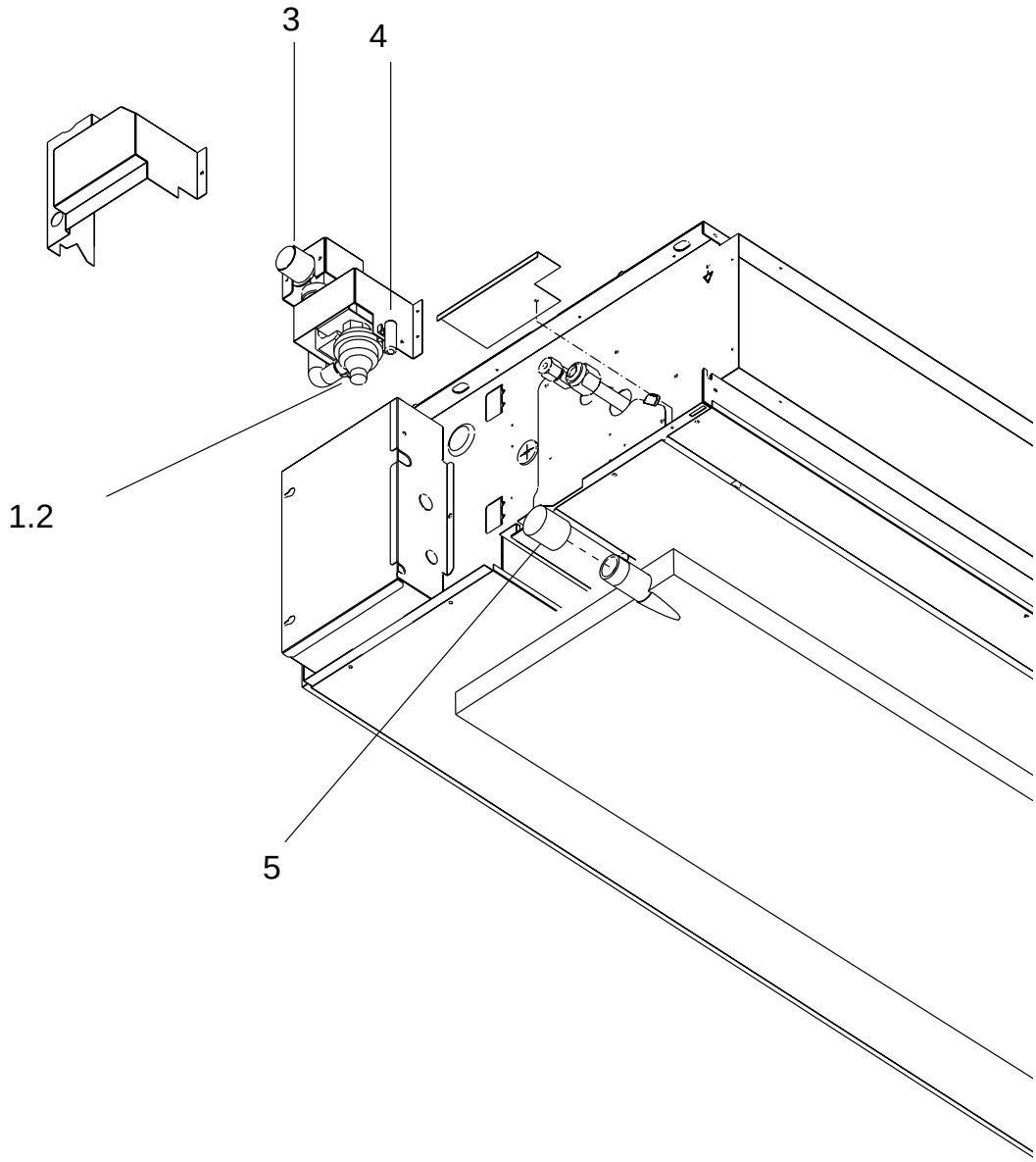
ELECTRICAL PARTS



No.	Part No.	Part Name	Drawing No.	Qt'y/set								Spec.
				PED-2EJA1	PED-2.5EJA1							
1	S70 010 713	Remote controller	BC00C006G34	1	1							J controller
2	S70 A00 305	Remote controller cable	BG00K507G02	1	1							10m
3	S70 010 304	Cable (for board)	BG78R190G10	1	1							0.5m
4												
5												

PED-2EJA1.UK
PED-2.5EJA1.UK

DRAIN WATER LIFT-UP PUMP PARTS (OPTIONAL PARTS)



No.	Part No.	Part Name	Drawing No.	Qt'y/set								Spec.
				PED-2EJA1	PED-2.5EJA1							
1	S70 11K 355	Drain pump-94	BG56J144G13	1	1							
2	S70 010 533	Cushion	DB26F111H03	4	4							
3	S70 K01 523	Drain socket ass'y	BB00P145G17	1	1							
4	S70 W28 266	Drain sensor ass'y	DE00H343G21	1	1							
5	S70 E69 558	Rubber plug	P312040X01	1	1							

10 MICROPROCESSOR CONTROL

1. OUTLINE OF MICROPROCESSOR CONTROL

INPUT to remote controller

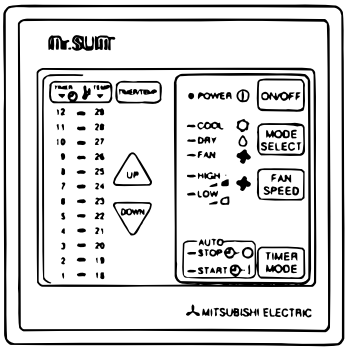
- ON-OFF switching.
- COOL-FAN selector switching.
- HIGH-LOW fan speed switching.
- TIMER mode selector switching.
- Thermostat setting.
- Timer setting.
- Self-diagnostic troubleshooting.
- Test run switching.

REMOTE CONTROLLER

- Transmits and receives orders.

OUTPUT to remote controller

- Indication lamps light.

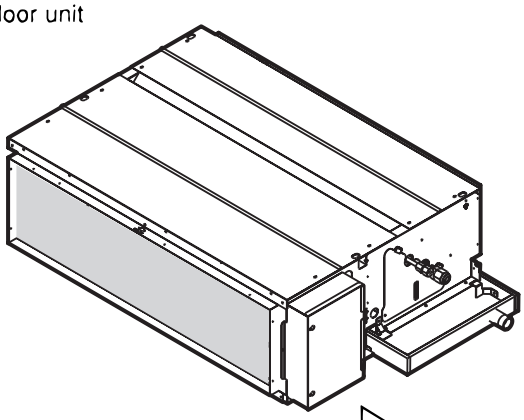


12

12V DC

Polar, twelve (12) - core cable
Maximum length 50m (164ft)

Indoor unit



INPUT from indoor unit

- Room temperature thermistor (RT1)
- Indoor coil thermistor (RT2)

INDOOR CONTROLLER BOARD

- Receives orders from remote controller and temperature data from indoor unit.
- Processes orders and data.
- Transmits the power of indication lamp to remote controller.
- Controls indoor and outdoor operation.
- Self-diagnostic function.
- ✻ System control operation.<Optional>
- ✻ Emergency operation.

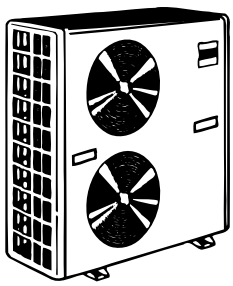
OUTPUT to indoor unit

- Fan : ON-OFF.
- Fan speed : HIGH-LOW.
- Emergency stop.

Non - polar, two (2) - core cable

12V DC

Outdoor unit



INPUT from outdoor unit

- Compressor protection device working

OUTDOOR UNIT

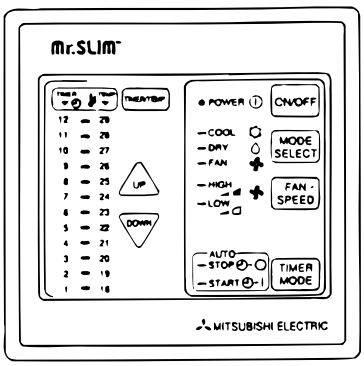
- Receives order from indoor controller.
- Emergency stop.

OUTPUT to outdoor unit

- Compressor motor and outdoor fan motor : ON - OFF

2. INDOOR UNIT CONTROL

2-1 COOL operation



Steady Flash OFF

<How to operate>

① Press POWER ON / OFF button.

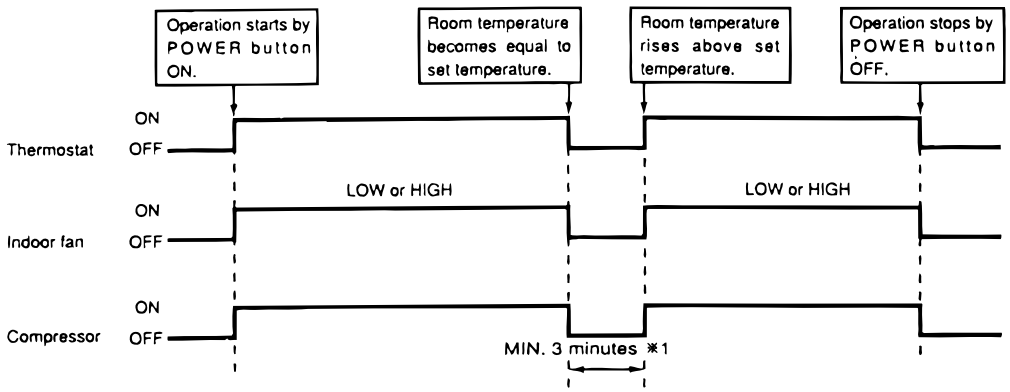
② Press MODE SELECT button to set operation mode to COOL.

③ Check [TEMP ▲▼] lamp is ON and set desired temperature with UP or DOWN button.

NOTES : 1. When [TIMER ▼] lamp is ON, press DISPLAY SELECT button to change the display to temperature mode.

2. Set temperature changes by 1°C in the range 18 ~ 29°C each time UP or DOWN button is pressed.
3. The lighting lamp shows the set temperature, and the flashing lamp shows the room temperature.
   When the room temperature is equal to the set temperature, the lamp keeps lighting, 0.5 seconds brightly and 0.5 seconds faintly.

<COOL operation time chart>



※1 Even if the room temperature rises above the set temperature during this period, the compressor will not start until this period has ended.

(1) Compressor control

① 3-minute time delay
To prevent overload, the compressor will not start within 3 minutes after stopping.

② The compressor runs when the room temperature is higher than the set temperature.
The compressor stops when the room temperature is equal to or lower than the set temperature.

③ The compressor stops in check mode or during protective functions.

④ Coil frost prevention
To prevent indoor coil frost, the compressor will stop when the indoor coil thermistor (RT2) reads 1°C or below after the compressor has been continuously operated for 16 minutes or more. The coil frost prevention is released under any of the following conditions.

- The indoor coil thermistor rises to 10°C or above.
- The room temperature becomes equal to or lower than the set temperature.
- COOL mode is stopped or changed to another mode.

NOTE : By cutting the jumper wire JRO2 on the indoor controller board, the temperature to start coil frost prevention changes from 1°C to -3°C.

⑤ Coil frost protection
When indoor coil temperature becomes -15°C or below, coil frost protection will proceed as follows.

<Start condition>
After the compressor has been continuously operated for 3 minutes or more, and the indoor coil temperature has been -15°C or below for 3 minutes,the coil frost protection will start.

<Coil frost protection>
Compressor stops for 6 minutes, and then restarts.
If the start condition is satisfied again during the first 10 minutes of compressor operation, both the indoor and outdoor units stop, and the remote controller displays this occurrence.

<Termination conditions>
Coil frost protection is released when the start condition is not satisfied again during the allowance, or when the COOL mode stops or changes to another mode.

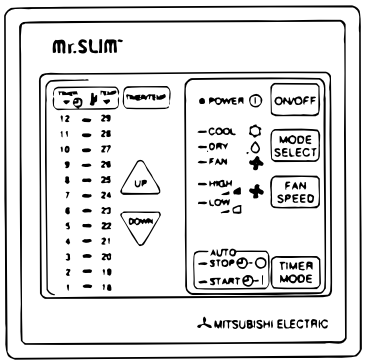
(2) Indoor fan control

Indoor fan speed LOW/HIGH depends on the remote controller setting.
However, if an outdoor unit abnormality is detected, the indoor fan speed will be LOW, regardless of the remote controller setting.

(3) Detecting abnormalities in the outdoor unit

After the compressor has been continuously operated for 3 minutes, if the difference between the indoor coil temperature and room temperature is out of RANGE C, for 1 minute, the indoor fan speed will turn to LOW. Five minutes latar, if the difference is in RANGEC, the fan speed will return to the set speed. If the difference is still out of RANGE C, the outdoor unit is deemed abnormal.
Thus, the compressor will stop and the trouble location is indicated on the remote controller.
RANGE A : Indoor coil temperature is more than 5 degrees above room temperature.
RANGE B : Indoor coil temperature is within 5 degrees either way of room temperature.
RANGE C : Indoor coil temperature is more than 5 degrees below room tempetature.

2-1 DRY operation



Steady Flash OFF

<How to operate>

① Press POWER ON / OFF button.
② Press MODE SELECT button to set operation mode to DRY.
③ Check [TEMP ▼▲] lamp is ON and set desired temperature with UP or DOWN button.

NOTES : 1. When [TIMER ▼] lamp is ON, press DISPLAY SELECT button to change the display to temperature mode.
2. Set temperature changes by 1°C in the range 18 ~ 29°C each time UP or DOWN button is pressed.
3. The lighting lamp shows the set temperature, and the flashing lamp shows the room temperature.
When the room temperature is equal to the set temperature, the lamp keeps lighting, 0.5 seconds brightly and 0.5 seconds faintly.

(1) Compressor control

① 3-minute time delay
To prevent overload, the compressor will not start within 3 minutes after stopping.
② The compressor runs when the room temperature is higher than the set temperature.
The compressor stops when the room temperature is equal to or lower than the set temperature.
③ The compressor stops in check mode or during protective functions.
④ The compressor will not start when the room temprature is below 18°C
The compressor starts intermittent operation when the power is turned ON with room temperature above 18°C. The compressor ON / OFF time depends on the thermostat ON / OFF and the room temperature as follows.
After 3-minute compressor operation,
- If the room temperature thermistor reads above 28°C with thermostat ON, the compressor will operate for 6 more minutes and then stop for 3-minutes.
- If the room temperature thermistor reads 26 °C ~28 °C with thermostat ON, the compressor will operate for 4 more minutes and then stop for 3 minutes.
- If the room temperature thermistor reads 24°C ~26°C with thermostat ON, the compressor will operate for 2 more minutes and then stop for 3 minutes.
- If the room temperature thermistor reads below 24°C with thermostat ON, the compressor will stop for 3 minutes.
- If the thermostat is OFF, regardless of room temperature, the compressor will stop for 10minutes.

⑤ Coil frost protection
Coil frost protection in DRY operation is the same as in COOL operation.

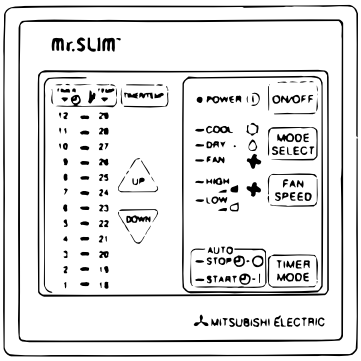
(2) Indoor fan control

The indoor fan runs on LOW speed during compressor operation. The fan speed cannot be changed with the remote controller.
Also, the indoor fan does not run during compressor OFF.

(3) Detecting abnormalities in the outdoor unit

An abnormality in the outdoor unit can not be detected in DRY operation.

2-3 FAN operation



<How to operate>

① Press POWER ON / OFF button.

② Press MODE SELECT button to set operation mode to FAN.

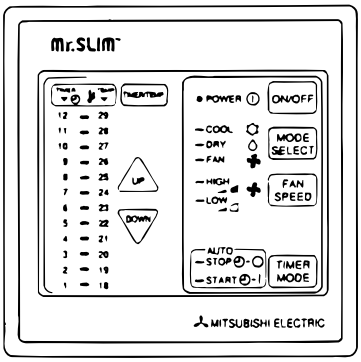
NOTES : Temperature can not be set in FAN operation.

■ Steady ▩ Flash □ OFF

(1) Indoor fan control

The indoor fan speed LOW / HIGH depends on the remote controller setting.

2-4 TIMER operation



■ Steady ▩ Flash □ OFF

<Timer function>

AUTO STOP ·····Air conditioner stops after the set time lapses.

AUTO START ·····Air conditioner starts after the set time lapses.

<How to operate • AUTO STOP timer>

① While [● POWER] lamp is lighting, press TIMER MODE button.
[AUTO ■ STOP ◴ → ○] and [TIMER ▼◴] lamps turn ON.

② Set the time for the AUTO STOP timer with the UP or DOWN button.
NOTE : The time setting is in 1 hour units up to 12 hours.

③ With the lapse of time, the timer lamps turn OFF one by one, showing the remaining time.

④ To cancel the AUTO STOP timer and continue operation, press the TIMER MODE button.
To cancel the AUTO STOP timer and stop operation, press the POWER ON/OFF button.

<How to operate AUTO START timer>

① While [○ POWER] lamp is OFF, press TIMER MODE button.
[AUTO ■ START ◴ → |] and [TIMER ▼◴] lamps turn ON.

② Set the time for the AUTO START timer with the UP or DOWN button.
NOTE : The time setting is in 1 hour units up to 12 hours.

③ With the lapse of time, the timer lamps turn OFF one by one, showing the remaining time.

④ To cancel the AUTO START timer and keep the unit OFF, press the TIMER MODE button.
To cancel the AUTO START timer and start operation, press the POWER ON / OFF button.

2-4 Test run

The unit starts the test run by pressing both the UP and DOWN buttons simultaneously for more than two seconds during [TIMER ▼◴] lamp ON or the unit OFF.

- The test run automatically stops after 2 hours.
- Set temperature is not displayed during test run.
- Room temperature is displayed by the flashing green lamp when DISPLAY SELECT button is pressed.
- The test run can be released by pressing the POWER ON / OFF or the TIMER MODE button.

<Initial setting>

The units are set as follows by the factory.

1) AUTO START set time : 12hours
   AUTO STOP set time : 12 hours
2) Initial operation mode : FAN (PE-EJ(S)A) / HEAT (PE-EJH(S)A)
3) Fan speed : LOW
4) Set temperature : 28°C

2-5 Self-diagnostic function

(1) When trouble occurs during operation, the unit stops and displays the trouble location with the timer lamps on the remote controller. All the other lamps are OFF

(2) To activate the self-diagnostic function for service, press the UP and DOWN buttons simultaneously for more than two seconds during operation with [TEMP ▶▼] lamp ON

(3) The timer lamps show the latest trouble. Trouble data is memorized until the next trouble occurs, even when the breaker turns OFF.

(4) All buttons except the POWER ON/OFF are unavailable during the self-diagnostic mode.

(5) To release the self-diagnostic mode, press the POWER ON /OFF button.

2-6 Emergency operation

When the remote controller or microprocessor malfunctions and no other trouble exists, emergency cooling operation is available by setting the dipswitch on the indoor controller board.

[Check items]

(1) Make sure the compressor and the fans are running normally.

(2) Locate the trouble with the self-doagnostic function. If the self-diagnostic function indicates that the protection device (such as coil frost protection) is functioning, the sources must be removed before attempting emergency operation.
Emergency operation ON / OFF is activated not with the remote controller but with the circuit breaker.

[Emergency operation procedure]

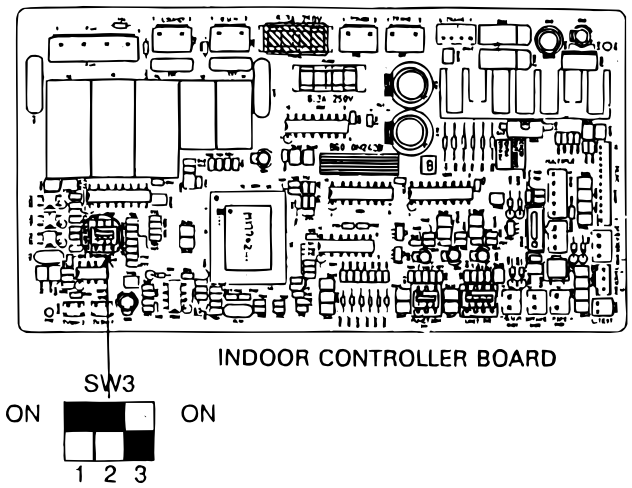
(1) Cooling operation is available by setting the dipswitch (SW3<I.B>) [1] and [2] ON and [3] OFF on the indoor controller board.

(2) To start emergency operation, turn the outdoor side circuit breaker ON first, and then the indoor side circuit breaker ON.

(3) During emergency operation, the indoor fan runs on HIGH speed, the compressor runs continuously.

(4) Thermostat will not function.

(5) Do not use emergency cooling operation for more than 10 hours, as the indoor coil may freeze.



INDOOR CONTROLLER BOARD

2-7 Function of jumper wire and dipswitch on indoor controller board

1. Jumper wire

① JR1···Jumper wire for the auto vanes.
Cut JR01 for the unit WITHOUT auto vanes.

② JR2···Jumper wire for the temperature to start coil frost prevention
Cutting JR02 changes the temperature from +1°C to -3°C.

③ JR3···Jumper wire for set temperature adjustment in HEAT mode.
In HEAT operation, heated air stagnates in the upper part of the room. The indoor unit installed in the upper part of the room will detect the air temperature higher than the actual temperature in the living space. This difference is about 4 degrees. Therefore, the temperature detected by the room temperature thermistor should be corrected 4 degrees down. The unit with JR04 attached.will make this adjustment.

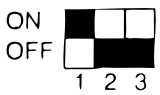
④ JR4···Jumper wire for the indoor fan speed during thermostat OFF in HEAT mode
Cutting JR04 changes the speed from Extra-Low to Low.

⑤ JR5···Jumper wire for detecting abnormalities in the outdoor unit
Cutting JR05 makes this detection unavailable. (Occurrence of abnormality can not be detected.)

⑥ JR6···Jumper wire for auto restart function
Cutting JR06 makes the auto restart function available.

2. Dipswitch

① SW1 (Function switch)

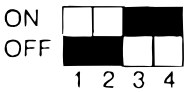


SW1-1) Switch for power supply
ON : 220V
OFF : 230V, 240V

SW1-2) Switch for single or twin control
ON : Twin control
OFF : Single control

SW1-3) Switch for unit number in twin control
(This switch is valid when SW1-2 is ON.)
ON : Unit No. 2
OFF : Unit No. 1

② SW2 (Unit switch)



SW2-1) Switch for air conditioner with or without electric heater
ON : Unit with electric heater
OFF : Unit without electric heater

SW2-2) Switch for air conditioner with or without heat pump
ON : Unit with heat pump
OFF : Unit without heat pump

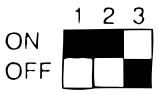
SW2-3) Switch for function code
ON : 1
OFF : 0

SW2-4) Switch for function code
ON : 1
OFF : 0

③ SW3 (Emergency operation switch)

Normal operation

For emergency cooling



11 TROUBLE SHOOTING

1. Self-diagnostic function

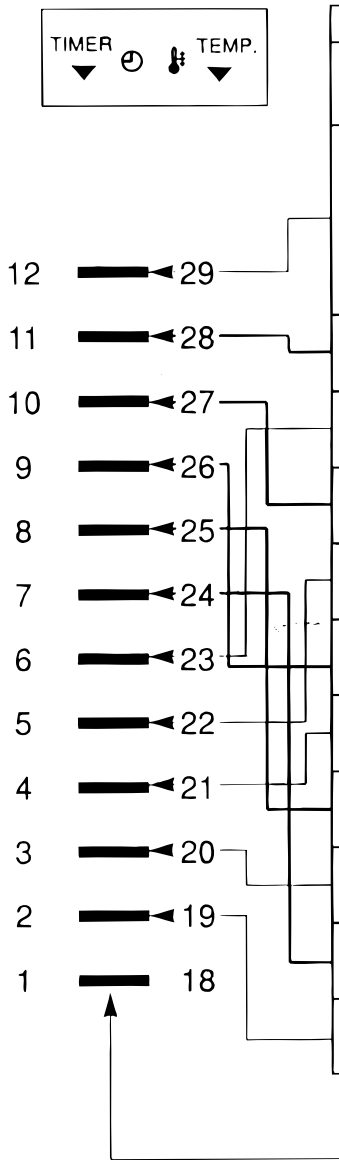
(1) When trouble occurs during operation, the unit stops and enters the self-diagnostic mode, and displays the trouble location with the timer lamps on the remote controller. All the other lamps are OFF.

(2) To activate the self-diagnostic function for service, press the UP and DOWN buttons simultaneously for more than two seconds during operation with [TEMP.] lamp ON.

(3) The timer lamps show the latest trouble. Trouble data is memorized until the next trouble occurs, even when the breaker turns OFF. To clear the memory, press the UP and DOWN buttons simultaneously for more than two seconds during the test run.

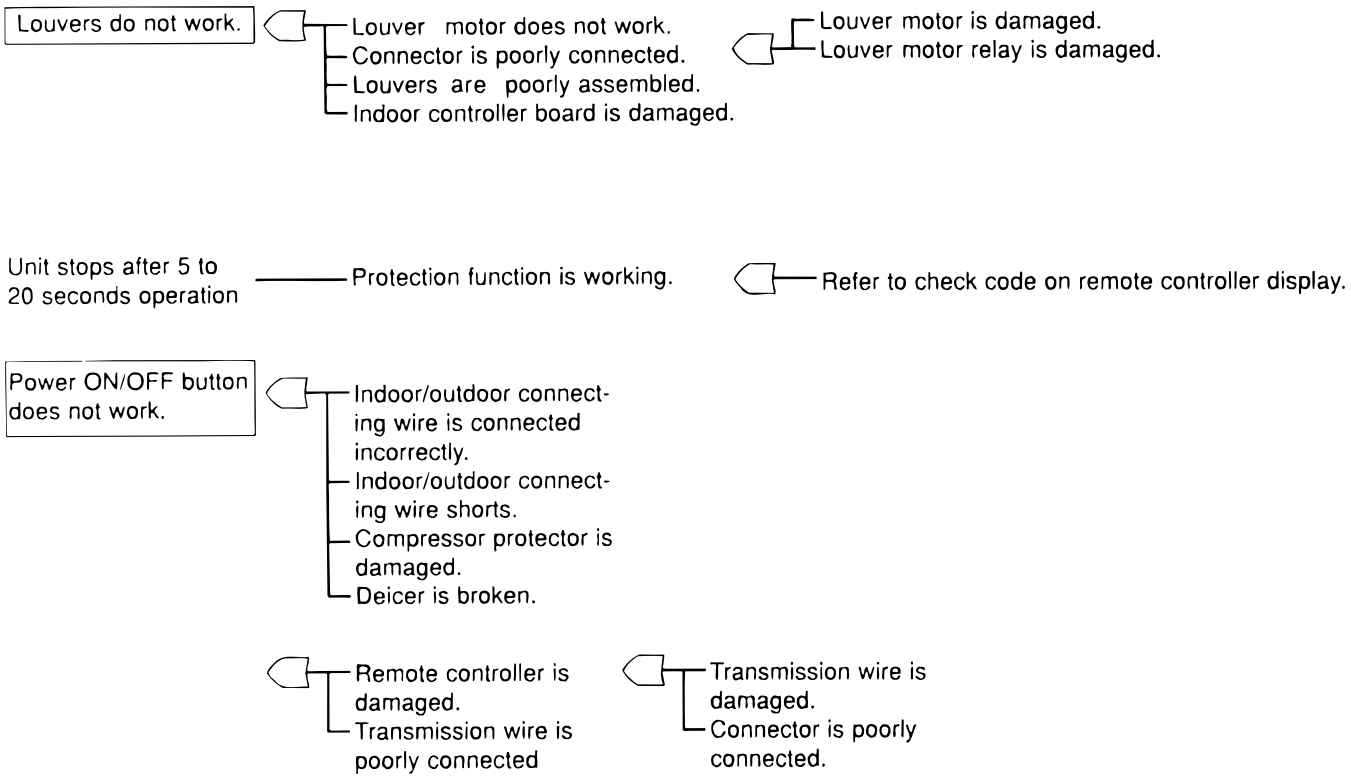
(4) All buttons except the POWER ON/OFF button are unavailable during the self-diagnostic mode.

(5) To release the self-diagnostic mode, press the POWER ON/OFF button.



Unit	Trouble location	Cause	Measures
Transmission error in twin control		● Wrong wiring between No. 1 and No. 2 units ● Poor connector contact	● Check dipswitch setting ● Check wiring
Outdoor unit		● Wrong wiring between indoor/outdoor units ● Outdoor unit abnormality detection ● Malfunction of outdoor coil thermistor ● Reversed phase detected	● Check wiring ● Check outdoor unit ● Check outdoor coil thermistor
Unit No.1 Unit No.2	Room temperature thermistor (RT1)	● Poor connector contact ● Thermistor malfunction	● Check connector ● Check thermistor → No trouble → replace indoor controller board.
Unit No.1 Unit No.2	Indoor coil thermistor (RT2)	● Poor connector contact ● Thermistor malfunction	● Check connector ● Check thermistor → No trouble → replace indoor controller board.
Unit No.1 Unit No.2	Drain sensor (DS)	● Poor connector contact ● Thermistor malfunction	● Check connector ● Check thermistor → No trouble → replace indoor controller board.
Unit No.1 Unit No.2	Drain overflow protection	● Drain pump malfunction ● Drain sensor improperly mounted	● Check drain pump ● Check drain sensor → No trouble → replace indoor controller board.
Unit No.1 Unit No.2	Coil frost or overheat prevention	● Air passage short cycle ● Air filter clogged ● Indoor fan malfunction	● Remove blockage ● Check air filter ● Check indoor fan

2. OTHER TROUBLES AND CAUSES



12 OPTIONAL PARTS

1. REFRIGERANT PIPES

Part No.	PAC-05FFS-E	PAC-07FFS-E	PAC-10FFS-E	PAC-15FFS-E
Pipe length	5m	7m	10m	15m
Pipe size OD	Liquid:/ø9.52 Gas:/ø15.88			
Connection method	Indoor unit:Flared Outdoor unit:Flared			

Note 1.How to connect refrigerant pipes.
Factory supplied optional piping contains refrigerant at above atmospheric pressure. As long as the connection takes no more than 5 minutes, no air will enter, and there will be no need for air purging. Remove the blind caps and make the connections within 5 minutes. After the connections for the indoor and outdoor units are made, open the stop valve on the outdoor unit to allow refrigerant gas to flow.
If piping length exceeds 5m, an additional charge of refrigerant is needed.
Note 2.The following main parts are contained in the optional refrigerant piping kit.
Heat insulating cover, vinyl tapes, nipples, sleeve and flange(for wall hole), connecting cables.

2. REMOTE CONTROLLER EXTENSION CABLE

When installing the remote controller at a distance from the air conditioner, use the designated extension cable with connector.

Part No.	PAC-905EC	PAC-906EC	PAC-918EC	PAC-919EC
Length	12m	20m	30m	50m

3. TIMER

When using a program timer, a program timer adapter (PAC-825AD)is also needed.

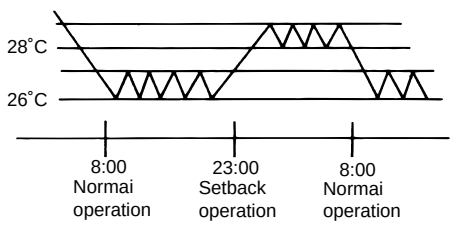
Part No.	PAC-SK65PT(with set back function)
Model Name	Program timer

3-1 Program timer specifications

Part name	Program timer
Part No.	PAC-SK65PT
Exterior dimensions(mm)	120X120X15 (mm)
Installation	Wall mount
Type of clock	Quartz
Clock accuracy	±50second/month
Display-Time	Liquid crystal display
-Week	Liquid crystal display
-Timer	Liquid crystal display
Program cycle	24 hours
Timer setting unit	30 minutes
No. of set points	48/day
Power rating	5V DC
Set back function	Provided

3-2 Feature of program timer

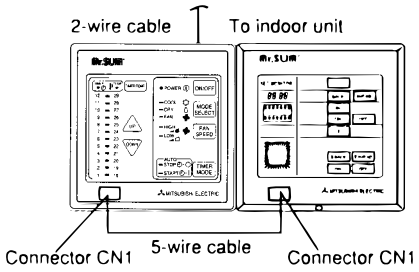
(1) Daily timer function
Daily timer can be set in 30 minute units for up to 24 hours.
Each unit can be set for unit ON, unit OFF, or setback operation.
(2) Setback operation(PAC-SK65PT)
Set back operation is useful for reducing running costs.
e.g.AT a hotel with a 24-hour system
8:00~23:00 Cooling operation with set temperature at 26 ˚C
23:00~8:00 Setback operation with 2 degrees of setback
As shown in the chart on the right, the set temperature rises 2 degrees automatically during the setback operation. When the set-back operation ends, normal operation will begin.



(3) Weekly timer function
Daily timer function can apply to each day of the week.

3-3 HOW to connect program timer

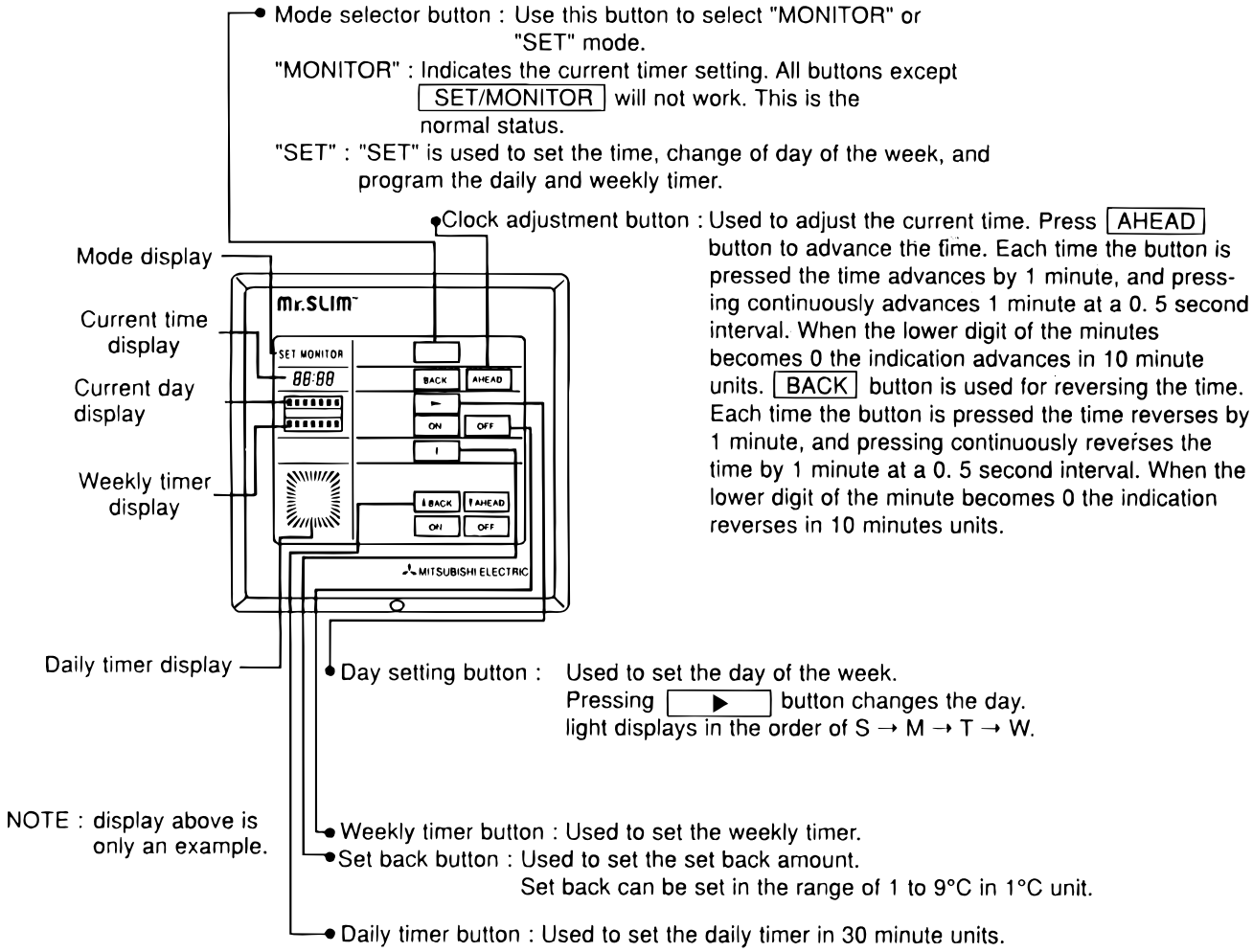
(1) Install the program timer next to the remote controller the same way as the remote controller is installed.
(2) Connect the program timer and the remote controller with a 6-wire cable as shown in the figure below.



NOTE: While the program timer is connected to the remote controller, the 24 hour ON/OFF timer on the remote controller will not operate.

3-4 Names and functions

<PAC-SK65PTA>

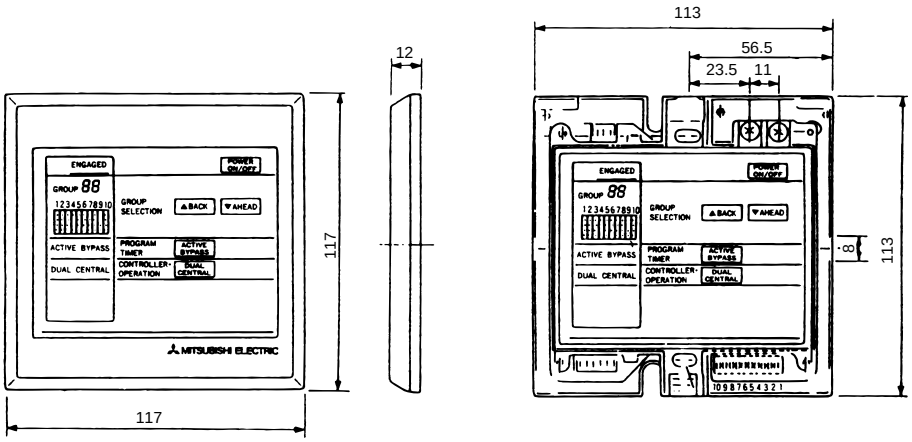


4. CENTRALIZED REMOTE CONTROLLER

Allows individual or combined control of up to 16 units.

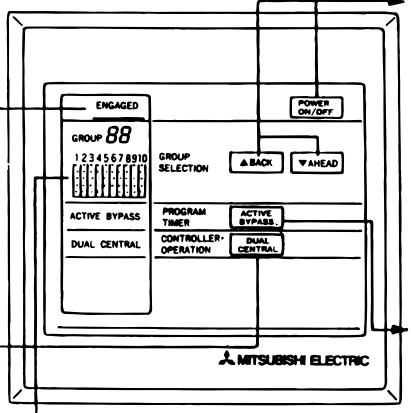
Part No.	PAC-805RC

4-1 Dimensions



Unit:mm

4-2 Functions



"ENGAGED" indicator
When this indicator is lit, transmisson is in progress and all swiches are inoperative.

DUAL / CENTRAL switch
This change-over switch governs the operation of the accessory remote controller.

"DUAL"
Instructions from both the accessory remote controller and the centralized remote controller are valid. (Priority given to the last instruction received.)

"CENTRAL"
ON / OFF switching by the accessory remote controller is invalidate. Operation is controlled by the centralized remote controller only.
Inital setting is "DUAL"

LCD Matrix display
This display indicates the operational status of all connected units either by steady lighting or by flashing.

POWER ON / OFF switch
Operation ON / OFF switch.

▲BACK ▼AHEAD buttons
These buttons are used to designate the attached unit (s). (They designate the unit to be centrally controlled.)
- When group "00" is designated ; collective ON/OFF instruction is sent to all units.
- When group "01" - "16" is designated ; ON/OFF instruction is sent only to the designated units.

ACTIVE / BYPASS switch
This change-over switch is for the program timer.
(It selects the timer operation on the program timer.)
Use "BYPASS" when a program timer is not connected.

"ACTIVE"
The switch turns ON/OFF commands given from the program timer automatically.

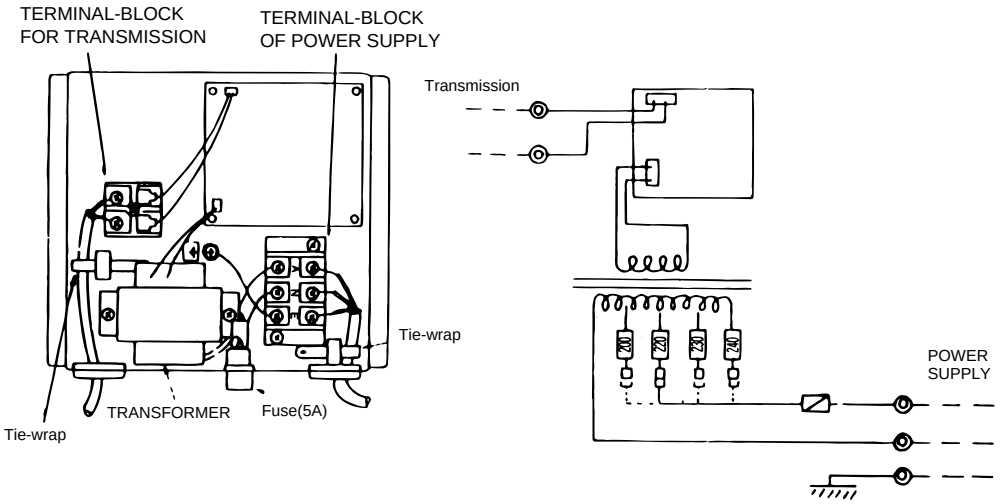
"BYPASS"
ON/OFF Operation is controlled by the centralized remote controller only. Initial setting is "BYPASS".

Independent "DUAL / CENTRAL" and "ACTIVE / BYPASS" setting of all the groups is prossible. When the power supply to the centralized remote controller is cut due to power failure, all settings will return to the original "DUAL" and "BYPASS".

4-3 Connection method

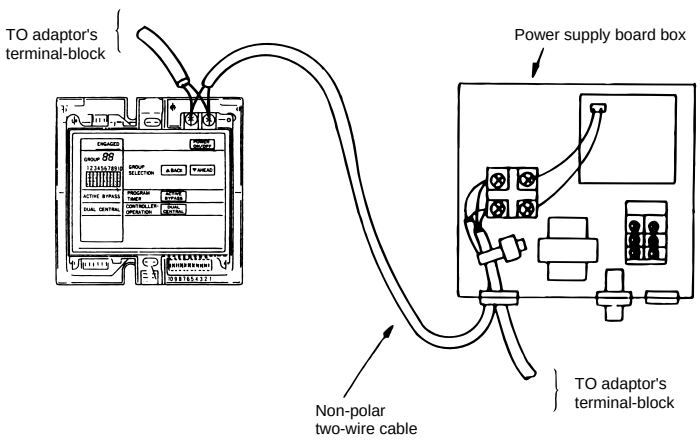
(1) Connection in the power supply cord.

1. Connect the power supply cord to the power supply terminal-block and fix in-place with a tie-wrap. Connect a single phase 200V AC(220, 230, 240V)to ⒶⓃ .
   As Ⓔ is the GND terminal,be sure to ground the earth wire.
2. Connect the transmission line to the transmission terminal-block and fix it in-place with a tie-wrap. Use a ø1.6 (AWG14)or above two-wire cable for the transmission line.
   CAUTION: Never connect the power supply cord to the transmission terminal-block.

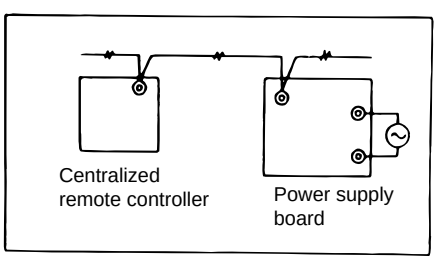


(2) Connection method of centralized remote controller and power supply board.

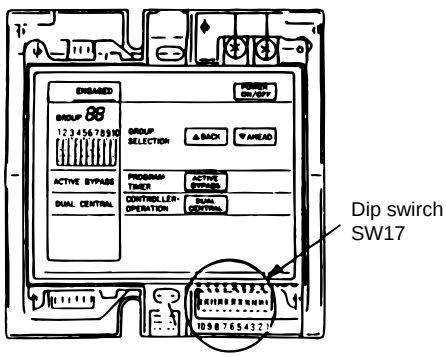
1. Connect the centralized remote controller and power supply board with a non-polar, two-wire cable.



2. Wiring diagram



3. Be sure to set the maximum address number with the dipswitch SW17 on the centralized remote controller.

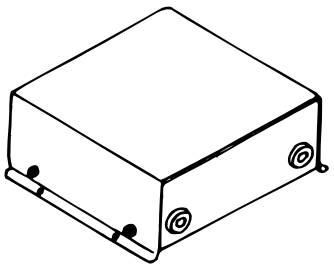
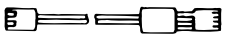


5. PROGRAM TIMER ADAPTER

This adapter is needed when a program timer(PAC-815PT)or a centralised remote controller(PAC-805RC)is used.

Part No.	PAC-825AD

5-1 Parts included

① ADAPTER ····· x1	② 3-core cable ····· x1	② 3-core cable ····· x1
	 Length:2m(6' 7")	 Length:2m(6' 7")
	② 4-core cable ····· x1	② 5-core cable ····· x1
	 Length:2m(6' 7")	 Length:2m(6' 7")

5-2 Connection method

Connection and wiring methods differ with the type of the indoor unit used. Confirm the type before carrying out the work.

(1) Connections in the adapter box

1. Connect the power supply cord to the terminal-block and fix in-place with a tie-wrap.
   Connect a single phase 200V AC(220, 230, 240V) to ⓁⓃ.
   As ⏚ is the GND terminal, be sure to ground the earth wire.
2. Connect the transmission line to the transmission terminal-block and fix it in-place with a tie-wrap, when a centralized remote controller is being used.
   CAUTION: Never connect the power supply cord to the transmission terminal-block.

fig.1

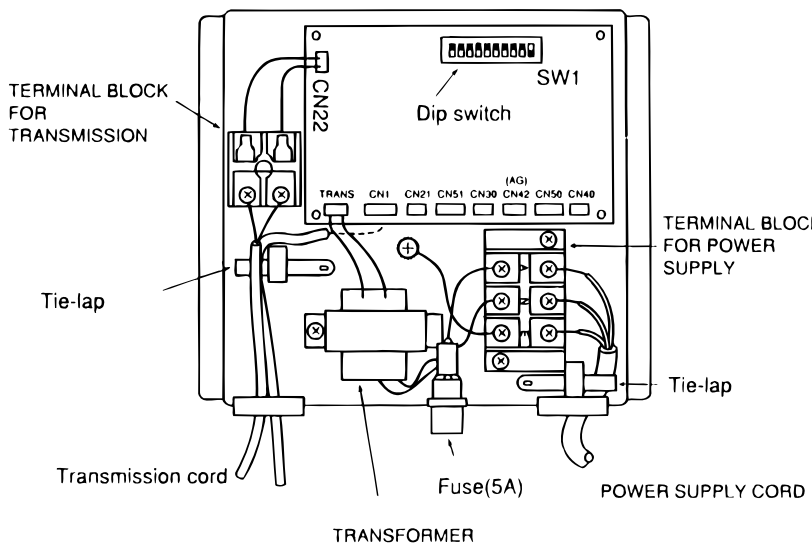
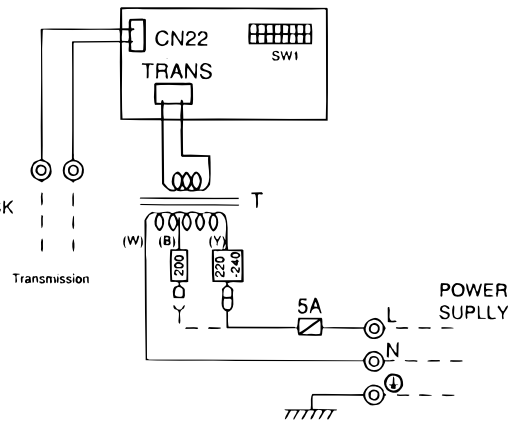
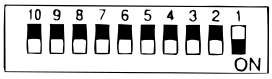


fig.2



3 Set the address number (from SW1-1 to SW1-6) in the dipswitch when a centralized remote controller is being used.
The address is the control number of each unit in the centralized control system.
As the address serves as a time-delay device as well, sequential starts (all units are triggered collectively by one single ON instruction)must be set with different address numbers (greater than 0) for each adapter.



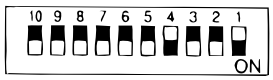
SW1

Levers No. 1-6 can set the following addresses respectively with binary notations.

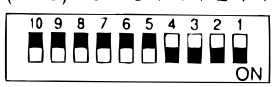
Toggle	No.6 ON	No.5 ON	No.4 ON	No.3 ON	No.2 ON	No.1 ON
Address	32	16	8	4	2	1

(Ex.1) 3 = 2 + 1

(Ex.2) 9 = 8 + 1

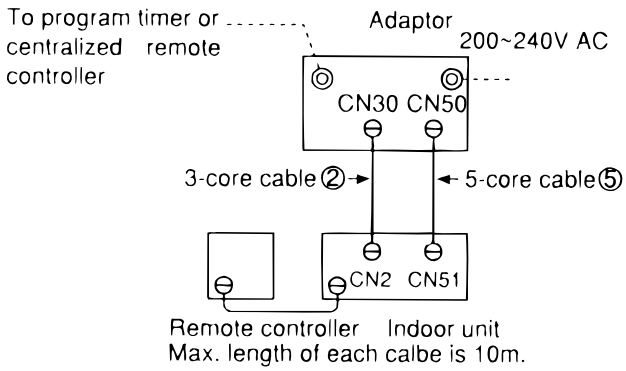


(Ex.3) 15 = 8 + 4 + 2 + 1



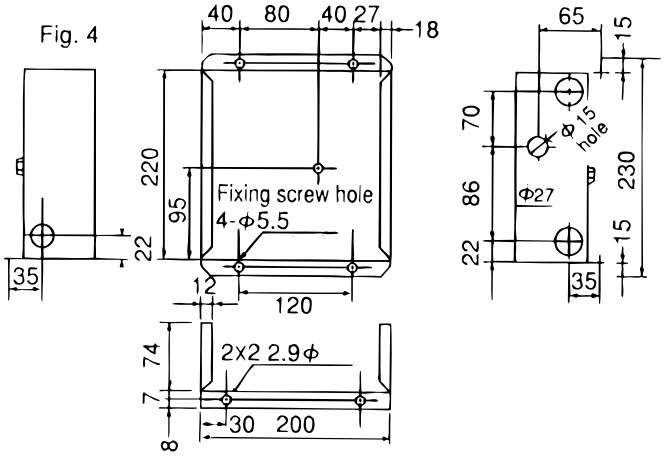
(2) Connection from adaptor

Fig.3



4. Dimensions

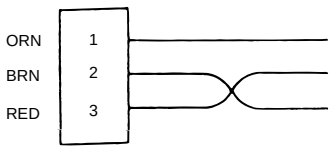
Fig. 4



6. TIMER ADAPTER

This adapter is needed for system control and for operation via external contacts.

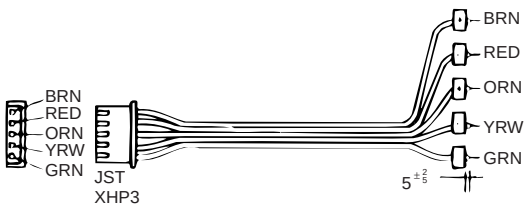
Part No.	PAC-SA89TA-E

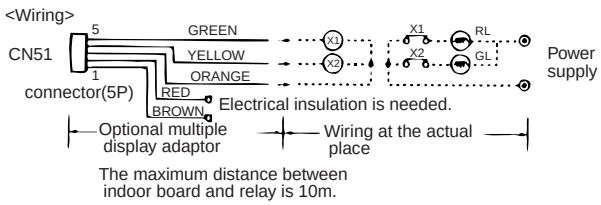


7. REMOTE INDICATION ADAPTER

This adapter is used for remote indication(operation/check.)

Part No.	PAC-559AD





8. DRAIN WATER LIFT-UP MECHANISM

This allows more versatility when selecting drain piping layouts.

Part No.	PAC-SK001DM-F
Applied model	PED-2EJA$_1$.UK, PED-2.5EJA$_1$.UK

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